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ABSTRACT

This curriculum guide outlines three credits of study, one credit for each of the grade levels 10, 11, and 12. Intended as an optional study area, the program provides awareness and exploration for those students who aspire to postsecondary study and introduces skills to those who wish to explore trades and technologies in employment after school. Each level has core and option modules that offer flexibility. Introductory materials include an overview, information on implementation, and goals and objectives. Graphics 101 has 11 modules: orientation and safety, career exploration, design, image generation, layout, relief printing, screen printing, continuous tone photography, lithography, binding and packaging, and process photography. Graphics 201 has eight modules: student orientation and safety, image generation, screen printing, process photography, lithography, continuous tone photography, relief printing, and binding and packaging. Graphics 301 has seven modules: orientation and safety, image generation, screen printing, continuous tone photography, process photography, lithography, and binding and packaging. Each module has these components: major objective, student objectives, teachers' notes and suggested activities, and suggested materials. Appended are a six-page chart correlating recommended material to module topics, 10 pages of references, and a list of 28 publishers. (YLB)

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Manitoba Education

1987

industrial arts

graphics 101,201,301

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This guide replaces the Graphic Communication guide of 1976 and has been developed as part of the revision for Industrial Arts curricula for grades 7 through 12 programs in Manitoba schools. This guide has been based upon recommendations provided by the Industrial Arts 10-12 Steering Committee and prepared as a result of recommendations to proceed with this project by the Curriculum Policy Review Council.

The Graphics 101, 201, 301 Industrial Arts Senior High Curriculum Ad Hoc Committee provided the writer with the necessary technical and pedagogic support in reviewing the curriculum throughout its development.

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overview

OVERVIEW

INTRODUCTION

The Industrial Arts 10-12 Graphics curriculum guide outlines three credits, one credit for each of the grade levels 10, 11, and 12. Several general features have been integrated throughout the guides:

1. Industrial Arts provides learning opportunities for the wide-ability range of learners;

2. Career exploration and planning is incorporated into Industrial Arts programs;

3. Industrial Arts at the secondary level assumes that students have had no junior high school exposure to the program area; and

4. Basic and generic skills include problem solving, creative designing and decision making.

This program should be viewed as an optional study area for all secondary students. It provides awareness and exploration for those students who aspire to post-secondary study, as well as introduces skills to those students who wish to explore trades and technologies in employment after school. The avocational use of basic and generic skills serves the entire spectrum of students.

Schools are encouraged to make special efforts to include those students in Industrial Arts programs who would normally perceive this area as traditionally suited to persons of the opposite sex. It is especially possible for the practical arts to play an important role in reversing sex-role stereotyping.

RATIONALE

Graphics 101, 201, 301, with its "hands-on" emphasis, has been designed to provide students with the opportunity to develop generic skills. Specifically, the Graphics program offers experiences in the following areas:

- planning
- designing
- assessing and estimating costs
- systematizing
- evaluating
- adjusting and diagnosing
- problem solving
- decision making.

Generally, Graphics 101, 201, 301 allows the student a flexible curriculum through which one can exercise time management, quality control, and teamwork.

This curriculum guide is a statement of INTENT, CONTENT, and DEPTH of study. It is prepared for the teacher as a guideline rather than a mandatory prescription. While teachers are invited to develop their course of study around this curriculum guide, it is ultimately left to them to assess and prepare their courses in accordance with their preferences for emphasis, the availability of facilities, their perception of student needs, school and administration philosophies, and community requirements. The use of CORE and OPTION modules is recommended to help the teacher accommodate the variables affecting the program.

STRUCTURE OF THE PROGRAM

Graphics 101, 201, 301 assumes that students who enter the program area for the first time will begin study at the 101 level. Each level has CORE modules which must be studied to the extent set by the teacher, and OPTION modules which offer the flexibility described in the Rationale for this course.

GRAPHICS 101

Module Title	Core-C Option-O	Page
01 Orientation and Safety	C	27 - 31
02 Career Exploration	C	32 - 33
03 Design	C	34 - 37
04 Image Generation	C	38 - 41
05 Layout	C	42 - 46
06 Relief Printing	C	47 - 53
07 Screen Printing	C	54 - 59
08 Continuous Tone Photography	C	60 - 66
09 Lithography	C	67 - 69
10 Binding and Packaging	C	70 - 74
11 Process Photography	O	75 - 77

GRAPHICS 201

Module Title	Core-C Option-O	Page
01 Student Orientation and Safety	C	81 - 82
02 Image Generation	C	83 - 89
03 Screen Printing	C	90 - 99
04 Process Photography	C	100 - 104
05 Lithography	C	105 - 109
Minimum of one of the following: (Core)		
06 Continuous Tone Photography	O	110 - 114
07 Relief Printing	O	115 - 116
08 Binding and Packaging	O	117 - 125

GRAPHICS 301

Module Title	Core-C Option-O	Page
01 Orientation and Safety	C	129 - 132
02 Image Generation	C	133 - 136
Minimum of three of the following: (Core)		
03 Screen Printing	O	136 - 141
04 Continuous Tone Photography	O	142 - 147
05 Process Photography	O	148 - 152
06 Lithography	O	153 - 158
07 Binding and Packaging	O	186 - 188

implementation

IMPLEMENTATION

SAFETY

Industrial Arts courses, being practical and "hands-on" in nature, require that schools and teachers plan implementation strategies with care to safety concerns. Throughout this guide, special mention is made of safety concerns with regard to higher risk activities. However, SAFETY IS A CONCERN AT ALL TIMES, and it is the responsibility of those who deliver the courses to ensure that adequate and reasonable safety precautions have been taken.

TIME ALLOTMENT

Graphics 101, 201, and 301 are considered to be secondary school credits. Each credit is intended to be comprised of 110-120 hours of study. It is left to the schools to adjust their preferred emphases within the course objectives so unique needs may be met using this guide.

INTEGRATION OF TOPICS

Whereas this curriculum guide provides a suggested sequence of modules and topics within modules, it is recommended that the implementation of the course be based upon continued integration and revision of the following topics:

- safety
- career exploration
- consumerism
- applied mathematics
- communication skills.

Teachers are expected to integrate topics as suited to their unique preferences, emphases, laboratory requirements, student needs and sequencing of topics within the course.

In some instances it may be the choice of a teacher to provide a THEME around which the course will be implemented. The following themes are commonly integrated in Industrial Arts programs:

1. Process Orientation - a theme which emphasizes the systematic use of materials;

2. Product, or Project Orientation - a theme which focusses on the net result of skills developed;

3. Design Orientation - a theme which develops the creative problem-solving, and decision-making processes in a generic sense;

4. Tools and Materials Orientation - a theme which focusses on the equipment and supplies used in that particular area of Industrial Arts.

MATERIALS

Suggested text and supplemental materials, both for student use and teacher reference, are referred to throughout the guide. More detailed bibliographic data is provided in an appendix to this guide.

SPECIAL NEEDS STUDENTS

Industrial Arts 101, 201, 301 is designed as an option program for ALL STUDENTS found in the secondary school. Many pupils headed for the technical areas of colleges and universities benefit from secondary exposure to design, engineering, electronics, and the trades. Industrial Arts serves the special needs of the university student.

The special needs of the greatest number of secondary school students would include the exploratory and generic skills development emphasized in Industrial Arts. There is a strong linkage between the practical arts and life-long avocational skills necessary to everyday life.

Industrial Arts can provide some motivational value for students who enroll in these courses because they offer "alternative" credits to other less pragmatic options. The "hands-on" nature of Industrial Arts provides a multifaceted dimension to learning. The many senses involved in practical arts offer students a greater chance to experience success in their particular learning modes. While Industrial Arts is NOT DESIGNED TO BE AN AREA OF STUDY FOR THE LEARNING IMPAIRED, it CAN accommodate students in unique ways.

Many innovative programs for the physically handicapped have been developed, with safety precautions being taken into account. The use of jigs and fixtures for specific handicaps has offered new successes to such students. Tailoring Industrial Arts to the handicapped requires careful scrutiny of the hazards, safety requirements, methodologies, and special supports (fixtures, jig aids), as well as the recognition necessary from administrators and colleagues.

EVALUATION

Industrial Arts involves both theoretical and practical learning. Teachers are expected to conduct student evaluations in accordance with: their predetermined course planning (syllabus); the special theme or orientation used in the implementation; the specific objectives set for each student (special needs taken into account); and the standards of performance agreed upon at the outset. These are VALIDITY issues which will reflect the appropriateness of grades issued.

Generally, all teachers agree upon the range of criteria worthy of evaluation. Each teacher must, however, provide a unique WEIGHTING to validate his/her special blend of program variables implemented.

goals and objectives

GOALS AND OBJECTIVES

PROGRAM GOALS

The general goals of the senior high school Industrial Arts programs include the following:

1. to develop creative potential in both vocational and avocational life;
2. to gain an awareness of the role played by technology in the modern world;
3. to assist in the selection of a career choice and career plan;
4. to acquire basic and generic skills in the use of common industrial tools, machines, and processes;
5. to develop a learning environment and attitude that fosters achievement in a practical manner;
6. to discover and develop talents, aptitudes and interests;
7. to develop problem solving skills;
8. to enhance one's understanding of self;
9. to develop teamwork attitudes and skills;
10. to foster an appreciation for decision making and problem solving techniques.

OBJECTIVES

The following listing includes all of the objectives for both the CORE and OPTION modules cited in the Level II section of the guide. While the implementation of the objectives is required, it is left to individual teachers to assess whether certain objectives will be integrated generally or taught individually.

Emphasis and sequencing is also left to the teachers' judgment, based on personal preferences, their assessment of student needs and preferences, the nature of facilities, and/or the particular theme around which the course is delivered (process, product, design, or tools orientation).

Graphics 101:

1. <u>Orientation and Safety</u>

The student should be able to:

- define <u>graphic arts</u>;
- explain the purposes of studying graphics;
- summarize the general outline of Graphics 101;
- identify the relationship between junior high graphic arts/communication and senior high graphics;
- list events leading to the development of the graphics process;
- identify the four processes central to the graphics industry;
- describe the various methods used to copy graphic images;
- explain the communication model;
- explain the need for safe practices in the lab;
- differentiate between those behaviours which are considered safe and those which are not;
- outline the need for safe clothing in the lab;
- understand the need for and importance of protective devices;
- demonstrate the correct use of the safety aids found in the lab;

- demonstrate a knowledge of the organization of the lab;
- identify and accept responsibility for housekeeping practices;
- locate the safety aids in the lab.

2. Career Exploration

The student should be able to:

- describe the structure and purpose of each level of a graphics reproduction company;
- distinguish between the seven different types of printing services commonly available;
- describe the function of employees in six major job classification areas of the graphics industry;
- explain the educational requirements for an individual in any of the six major job classification areas of the graphics industry;
- determine if educational programs are available locally to assist in gaining entry to the graphics industry;

3. Design

The student should be able to:

- recognize the fundamental elements of design;
- incorporate the elements of design into particular projects;
- explain the effect of design elements on the finished copy;
- define the basic principles of design;
- explain the effect of design principles on a finished copy;
- list the design steps used to prepare a completed print;
- prepare a thumbnail sketch;
- prepare a rough layout;
- prepare a comprehensive layout;
- prepare a final layout;
- prepare a "dummy";
- develop an appreciation for properly designed work;
- explain the relationship between design and production methods;
- explain the concept and advances within computer assisted design.

4. Image Generation

The student should be able to:

- identify examples of dry transfer processes;
- use a dry transfer process in the preparation of a layout;
- describe three pen and ink methods of image generation;
- produce a layout using a pen and ink method of image generation;
- explain the operation of three types of strike on devices;
- differentiate between proportional and constant spacing;
- illustrate the use of justified text;
- prepare a layout using a strike on process;
- identify uses of commercially prepared copy components;
- use commercially prepared copy components.

5. Layout

The student should be able to:

- identify the basic lettering styles;
- describe the features of six typeface classifications;
- explain the uses of the styles of lettering;
- identify tools associated with the lettering process;
- use the tools in preparing a lettering layout;
- explain how type is measured by using the point system;
- demonstrate the ability to take measurement in the Imperial and Metric system of measurement;
- list the point sizes of body type;
- list the point sizes of display type;
- identify the tools associated with the layout process;
- demonstrate the correct use of the tools associated with the layout process;
- identify the tools associated with the paste-up process;
- demonstrate the correct use of these tools in the paste-up process;
- describe the steps for preparing a single color paste-up;
- describe the steps in preparing a mask;
- prepare a single color paste-up.

6. Relief Printing

The student should be able to:

- outline the history of the development of moveable type;
- define the term relief printing;
- describe the intended use of the sign press;
- prepare a layout suitable for production on the sign press;
- review the function of the sign press and the safe use of the equipment;
- produce a print using the sign press;
- analyze a finished print with the intent of correcting problems associated with the use of the poster printer;
- demonstrate the proper procedure for the clean-up of the equipment associated with the poster printer;
- identify the parts of a piece of moveable type;
- describe the characteristics of at least two type faces;
- explain the system by which spacing material is organized;
- differentiate between leads and slugs with regard to their intended use;
- prepare a layout suitable for production on the letterpress;
- set and proof type;
- justify a line of type;
- lock-up a type form;
- operate the letterpress in a safe manner;
- produce a print of acceptable quality using the letterpress;
- analyze a letterpress print with the intent of overcoming problems associated with the letterpress equipment or its operation;
- demonstrate the proper procedure for the clean-up of the press and its associated equipment;
- redistribute type;
- explain the use of a rubber stamp;
- prepare a layout suitable for conversion into a rubber stamp;

- describe the equipment required to produce a rubber stamp;
- produce a matrix from set type;
- produce a finished rubber stamp from a matrix;
- operate the equipment associated with the production of a rubber stamp in a safe fashion;
- solve problems related to the operation of the rubber stamp equipment;
- properly cleanup the rubber stamp making equipment;
- redistribute type.

7. Screen Printing

The student should be able to:

- outline the history of the development of hand cut film;
- describe the general theory of the screen printing process;
- list the uses of the screen printing process;
- demonstrate the safe use of the tools and materials associated with the screen printing process;
- prepare a screen printing frame;
- describe the function of the tools and materials used in screen printing;
- produce a hand cut stencil;
- prepare a screen print from a hand cut stencil;
- understand the composition and properties of screen printing inks;
- identify ink types and their uses;
- analyze a screen print with the intent of overcoming problems associated with the screen printing process;
- demonstrate the correct clean-up procedure;
- explain the theory of the action of the photographic film stencil;
- prepare a transparency suitable for exposing a photographic film stencil;
- properly expose a photographic film stencil;
- develop, washout, and adhere a photographic film stencil;
- print a photographic film stencil;
- analyze a print produced by a photographic film stencil with the intent of overcoming any problems associated with the use of the photographic film stencil;
- demonstrate the correct clean-up procedure;
- identify the parts of a copy camera;
- outline the differences between line and continuous tone copy;
- explain the theory of photography;
- expose a PMT transparency;
- process a PMT transparency.

8. Continuous Tone Photography

The student should be able to:

- explain the principles of composition as they relate to continuous tone photography;
- define four compositional effects;
- explain the theory of light transmission;
- describe the operation of a pinhole camera;
- differentiate between viewfinder, rangefinder, and reflex cameras;
- explain the function of the parts of a single lens reflex camera;
- describe two special purpose cameras;
- describe the use of the equipment used in film processing;

- identify the characteristics of black and white film with respect to size and speed;
- list the steps in processing black and white film;
- process a film;
- analyze the results of the processing with the intent of overcoming problems associated with processing;
- explain the use of the equipment required to make an enlargement;
- discuss two different types of enlargers and identify their parts;
- discuss the identifying characteristics of projection papers;
- prepare a proof using the contact printing process;
- prepare a test strip;
- analyze a test strip;
- prepare a projected print;
- analyze a projected print with the intent of overcoming problems associated with projection printing;
- demonstrate the correct method of clean-up;
- dry and mount a projected print.

9. Lithography

The student should be able to:

- outline the theory of planographic printing;
- describe the four basic systems of the offset press;
- identify the three major cylinders of the offset press;
- make operating adjustments to the offset press;
- prepare a direct image/electrostatic offset plate;

- produce a print by operating the press in a safe manner;
- analyze a print produced on the offset press with the intent of overcoming any problems associated with the operation of the press;
- demonstrate the proper method of clean-up on the offset press;
- list the characteristics of offset inks;
- distinguish between the two major types of offset presses;
- identify those pieces of equipment which are classified as "duplicators".

10. Binding and Packaging

The student should be able to:

- describe various types of binding used in the bookbinding industry;
- prepare a simple pad using rubberized padding compound;
- explain the process of perfect binding;
- describe the use of "crash" in the bookbinding operation;
- properly and safely trim a pad;
- explain the difference between side binding and saddle stitching;
- describe two methods of applying covers;
- explain the reason for the cornering operation;
- describe the steps in the cornering operation;
- describe the paper manufacturing procedure;
- describe the properties of paper and the importance of the selection process;
- identify the procedure of operating a paper cutter;
- operate a paper cutter safely;

11. Process Photography

The student should be able to:

- define the term line photography;
- describe the composition of a piece of lithographic film;
- explain the theory of exposure of a lithographic film;
- outline the use of the adjustments on a process camera;
- describe the use of a gray scale;
- prepare a lithographic negative;
- state the complete name given to the PMT process;
- describe the diffusion transfer process;
- list the steps involved in preparing a PMT print;
- process a PMT print;
- analyze a PMT print with regard to overcoming problems associated with the process.

Graphics 201:

1. Student Orientation and Safety

The student should be able to:

- define graphic arts;
- explain the purposes of studying graphics;
- list the events leading to the development of the graphics process;
- identify the four processes central to the graphics industry;
- describe the various methods used to copy graphic images;
- explain the communication model;
- explain the need for safe practices in the lab;
- differentiate between those behaviours which are considered safe and those which are not;
- outline the need for safe clothing in the lab;
- understand the need for and importance of protective devices;
- demonstrate the correct use of the safety aids found in the lab;
- demonstrate a knowledge of the organization of the lab;
- identify and accept responsibility for housekeeping practices;
- locate the safety aids in the lab.

2. Image Generation

The student should be able to:

- identify the parts of a process camera;
- determine the enlargement and reduction for camera copy;
- differentiate between the types of light sensitive films used in the PMT process;
- explain the theory of the dye transfer process;
- make the appropriate camera settings required to expose a PMT negative;
- process an exposed PMT negative;
- examine a PMT print with the intention of identifying and correcting any problems associated with the PMT process;
- describe the equipment and materials used to produce a strip print;
- explain the steps involved in making a contact strip print;

- list the differences between the contact strip printing process and the projection strip printing process;
- outline the process of photo typesetting;
- identify two types of airbrushes;
- explain the airbrush operation theory;
- list the types of ink suitable for use in an airbrush;
- describe the use of masks in the airbrushing process;
- outline the uses of the airbrushing process;
- understand the dangers associated with the use of the airbrush and its supporting materials;
- set up the airbrush and compressor for proper operation;
- create an illustration using an airbrush.

3. Screen Printing

The student should be able to:

- outline the steps involved in coating a screen with photographic emulsion;
- list the steps involved in the exposure of a photo direct screen;
- describe the processing of a photo direct screen;
- prepare a photo direct screen;
- demonstrate the proper cleanup procedure associated with the printing process;
- solve problems associated with the photo direct screen printing process;
- list examples of indirect films and their uses;
- prepare a photo indirect stencil;
- produce a screen print using a photo indirect stencil;

- demonstrate the proper method of clean-up associated with this screen printing process;
- evaluate a screen print with the intention of solving problems associated with this process;
- prepare a photo direct/indirect stencil;
- produce a screen print using a photo direct/indirect stencil;
- prepare the positives which represent the color separations required;
- demonstrate the use of paper feeding guides;
- explain the process of color registration;
- prepare a multicolor screen print;
- demonstrate the proper method of clean-up associated with this process;
- evaluate a print to determine the source of and solution to any problems;
- prepare a screen and stencil for printing a heat transfer;
- describe the types of ink used in the transfer process;
- print a heat transfer on a piece of release paper;
- demonstrate the correct method for curing the transfer;
- transfer the print onto a piece of textile;
- demonstrate the proper method of clean-up associated with this process;
- evaluate a transfer to determine the source of and solution to any problems;
- demonstrate an understanding of the concept of vacuum screen printing;

- prepare a screen print;
- evaluate a print to determine the source of and solution to any problems;
- demonstrate proper clean-up methods associated with this process.

4. Process Photography

The student should be able to:

- use the processes of image generation to prepare a paste-up;
- identify line copy;
- describe the composition of lithographic film;
- explain the function of the gray scale;
- expose a line negative;
- process a line negative;
- adjust exposure time based on the gray scale;
- evaluate a line negative to determine the source of and solution to any problems;
- identify continuous tone copy;
- explain the use of a densitometer;
- describe the characteristics of a halftone screen;
- calculate the exposure time required to expose a halftone negative;
- expose a halftone negative;
- process a halftone negative;
- identify the dot structure in a halftone negative;
- adjust the exposure times to reposition a dot;
- evaluate a halftone negative to determine the source of and solution to any problems;

5. Lithography

The student should be able to:

- strip a flat;
- strip a combined flat;
- strip flats for special effects;
- describe the characteristics of a photographic plate;
- expose a photographic plate;
- process a photographic plate;
- evaluate a plate to identify any problems and their solutions;
- describe the characteristics of a tinting screen;
- explain the function of a tinting screen; prepare a photographic plate using a tinting screen;
- prepare flats which represent the color separations;
- explain the registration process for multicolor flats;
- expose and process plates for a multicolor print;
- explain the "step and repeat" process;
- expose and process a "step and repeat" plate.

6. Continuous Tone Photography

The student should be able to:

- explain the effect of filters on an exposure;
- demonstrate the principles of photographic composition;
- relate the speed of a film to a particular lighting/motion condition;
- explain the effect of aperture on depth of field;
- produce a photographic print using at least three print manipulation techniques;
- evaluate a photographic print to identify any problems and their solutions;

- explain the effect of shutter speeds on motion;
- describe the use of two types of exposure metering devices;
- demonstrate the use of metering devices;
- define the focal length of a lens;
- describe the characteristics of lenses of differing focal lengths;
- prepare photographic prints using lenses of differing focal lengths;
- produce a positive image on film;
- list the steps to be followed in color slide processing;
- demonstrate the multi-step developing process for color slides;
- mount a processed slide;
- evaluate a slide to identify any problems and the solution to them.

7. Relief Printing

The student should be able to:

- provide a history of the origin of foil stamping;
- describe the uses of foil stamping;
- list the equipment and supplies required to produce a foil stamp;
- explain the process of producing a foil stamp;
- differentiate between the hand and machine stamping processes;
- identify the uses of flexographic printing;
- list the types of printing mediums;
- explain the process of producing a flexographic plate;
- describe the process used to print a flexographic plate.

8. Binding and Packaging

The student should be able to:

- explain the use of the coil binding system;
- describe the operation of the punch and comb machine;
- list the steps to be followed in assembling a coil bound book;
- explain the use of punched stock;
- describe the operation of the punching machine;
- explain the need for drilled stock;
- describe the operation of the drilling machine;
- explain the purpose of cornering;
- describe the operation of the cornering machine;
- identify the grain of a piece of stock;
- describe the two classes of folds;
- explain the hand folding process;
- list two types of machine folders;
- describe the operation of a machine folder;
- explain the need for the stitching process;
- describe the saddle stitching operation;
- describe the side stitching operation;
- explain the need for the collating process;
- differentiate between hand and machine collating;
- briefly describe the operation of a machine collator;
- state the need for having perforated stock;
- explain the use of perforating rule;
- describe the perforating operation;

. explain why stock is scored;
. describe the use of scoring rule;
. outline the operation of a scoring machine;
. differentiate between slitting and trimming;
. explain the use of the signature binding system;
. describe the signature binding operation;

Graphics 301:

1. Orientation and Study

The student should be able to:

. define graphic arts;
. explain the purposes of studying graphics;
. list the events leading to the development of the graphics process;
. identify the four processes central to the graphics industry;
. describe the various methods used to copy graphic images;
. explain the communication model;
. explain the need for safe practices in the lab;
. differentiate between those behaviours which are considered safe and those which are not;
. outline the need for safe clothing in the lab;
. understand the need for and importance of protective devices;
. demonstrate the correct use of the safety aids found in the lab;
. demonstrate a knowledge of the organization of the lab;
. identify and accept responsibility for housekeeping practices;
. locate the safety aids in the lab.

2. Image Generation

The student should be able to:

. recognize the necessity of a color proofing system using color separated negatives;
. describe the use of a color proofing system;
. expose a set of color proofs from a set of color separated negatives;
. process a set of color proofs;
. explain the advantages of a computerized system of image generation;
. prepare a report detailing the uses of a computerized image generation system;
. outline the operation of a computerized image generation system;
. identify a local graphics company using a computerized image generation system and provide a description of how the system is being used by that company.

3. Screen Printing

The student should be able to:

. list six products which are promotional in nature and prepared by using the screen printing process;
. produce a set of positives suitable for screen printing a promotional product;
. list the criteria for selecting a stencil material for a particular job requirement;
. choose an appropriate printing ink based on the choice of substrate;

- explain the drying procedure for a chosen ink;
- produce a personally selected promotional screen print;
- demonstrate the proper method of cleanup for the processes used in the actual production of the print;
- analyze a completed print to identify any problems, their causes and their solutions;
- identify some printing surfaces which may not be printed on in the usual manner;
- prepare a design suitable for printing on a non-flat surface;
- set up the machinery used for printing on a non-flat surface;
- operate the machinery used for printing on non-flat surfaces in a fashion considered to be safe and correct;
- produce a print on a non-flat surface;
- demonstrate the proper method of cleaning the equipment required to produce a print on a non-flat surface;
- analyze a finished print to identify any problems, their causes and their solutions;
- identify materials which must be reproduced by using halftone techniques;
- select stencil and screen material suitable for reproducing halftone prints;
- create a photographic halftone positive for exposing a stencil;
- produce a quality halftone print using the screen printing process.

4. Continuous Tone Photography

The student should be able to:

- list various types of artificial lighting sources;

- define characteristics of light quality;
- state the effect of diffused light on a subject;
- explain the use of bounce lighting;
- illustrate the use of tent lighting;
- use below eye level lighting effectively;
- explain the make-up of color negative film;
- describe the process of image formation on a color negative;
- adjust light temperatures using a filtering system;
- process a color print;
- evaluate a color print to determine if it contains correct color balance;
- differentiate between three color printing processes;
- create a hair highlight on a subject using the appropriate lighting technique;
- determine when to use back lighting as a means of emphasis;
- simulate natural lighting using top and side lighting techniques;
- select the correct lens for shooting a portrait;
- describe the various cameras that are suitable for portraiture photography;
- properly position a subject for a portrait;
- use a backdrop to create a desired effect;
- discuss the effect of various films and papers on the finished portrait;
- prepare a portrait.

5. Process Photography

The student should be able to:

- explain the use of duotones;

- use the correct terminology associated with duotones;
- state the criteria used to select an original image suitable for duotoning;
- discuss the moiré problem and its solution;
- prepare light and dark printers;
- proof the light and dark printers;
- print a duotone;
- examine a duotone print to identify any problems, their causes and their solutions;
- state the reason for using posterization;
- discuss the problems associated with posterization;
- prepare the negatives for a three-tone posterization;
- print an example of a posterization;
- examine the finished copy to identify any problems, their causes and their solutions;
- define the terms spread and choke;
- state the uses of spreads and chokes either in a combined or individual format;
- prepare an outline using a spread and choke;
- print an outline produced by a spread or choke negative;
- analyze a piece of finished copy to identify any problems, their causes and their solutions.

6. Lithography

The student should be able to:

- identify the primary additive colors;
- list the primary substractive colors;
- explain the process of color separation using filters;
- state what step is taken to avoid the production of a moiré pattern during the halftoning process;
- differentiate between processes used to produce color separations;
- discuss the advantages and disadvantages of each process;
- print a four color reproduction;
- analyze a four color reproduction to identify any problems, their causes and their solutions.

7. Binding and Packaging

The student should be able:

- explain the use of the coil binding system;
- describe the operation of the punch and comb machine;
- list the steps in the assembly of a coil bound book;
- explain the use of punched stock;
- describe the operation of the punching machine;
- explain the need for drilled stock;
- describe the operation of the drilling machine;
- explain the purpose of cornering;
- describe the operation of the cornering machine;
- identify the grain of a piece of stock;
- describe the two types of folds;
- explain the hand folding process;
- list two types of machine folders;
- describe the operation of a machine folder;
- explain the need for the stitching process;
- describe the saddle stitching operation;
- describe the side stitching operation;
- explain the need for the collating process;

- differentiate between hand and machine collating;
- briefly describe the operation of a machine collator;
- state the need for having perforated stock;
- explain the use of perforating rule;
- describe the perforating operation;
- explain why stock is scored;
- describe the use of scoring rule;
- outline the operation of a scoring machine;
- differentiate slitting from trimming;
- explain the use of the signature binding system;
- describe the signature binding operation;
- prepare a casebound book containing examples of work produced in the course.

graphics 101

GRAPHICS 101

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ORIENTATION AND SAFETY (GR101-01)

Major Objectives: To explore the significance of graphic arts in meeting the personal needs of students as well as the needs of the larger community.
To develop attitudes allowing students to work effectively with the materials and equipment used in graphic arts.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. PROGRAM REVIEW The student should be able to:		
1. Define graphic arts.	Have students prepare their own definition of graphic arts. Compare their definitions with more widely accepted definitions.	Graphic Arts Printing and allied crafts, including papermaking, binding and photography.
2. Explain the purposes of studying graphics.	Illustrate to students the impact that graphics have on their daily lives. Use various examples such as: 1. Newspapers 2. Textbooks 3. Television graphics.	
3. Summarize the general outline of Graphics 101.	Provide students with a course outline. Discuss the general topics to be covered in the course and explain how the learning will take place.	
4. Identify the relationship between junior high graphic arts/communication and senior high graphics.	Explain the difference between junior and senior high graphics, highlighting the goals of senior high graphics.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. List events leading to the development of the graphics process.	Have students prepare a timeline and a short essay representing the development of the graphics processes.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 1
6. Identify the four processes central to the graphics industry.	Have students prepare definitions of each of the four processes. Discuss and show examples of each process.	Processes Central to Graphics Industry 1. Letterpress 2. Gravure 3. Screen Printing 4. Lithography Graphic Reproduction, Bennett Publishing, Unit 1
7. Describe the various methods used to copy graphic images.	Show examples of material copied by various methods.	Copying Processes 1. Continuous Tone 2. Microfilm/Microfiche 3. Blueprints 4. Electrostatic Copies Graphic Reproduction, Bennett Publishing, Unit 1

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
8. Explain the communication model.	Define source, message, medium and receiver, explaining how these components constitute a communication model. Emphasize that without some form of feedback, there is no real communication, but merely a monologue.	Communication Model Source—Message—Medium—Receiver Feedback Printing Technology, Breton Publishers, Chapter 1
B. SAFETY The student should be able to:		
1. Explain the need for safe practices in the lab.	Discuss the reason for using practices which are considered safe.	Photo-Offset Lithography, Goodheart-Willcox, Unit 1 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 3
2. Differentiate between those behaviours which are considered safe and those which are not.	Have students prepare a poster illustrating (listing) practices which are considered to be safe.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. Outline the need for safe clothing in the lab.	Illustrate how various types of clothing can interfere with safe practices. Point out the hazards associated with loose clothing, jewellery, long hair and long sleeves. Have students participate in setting a dress code.	
4. Understand the need for and importance of protective devices.	Have students identify and explain the purpose of various protective devices.	Protective Devices 1. Safety glasses/goggles 2. Face shields 3. Gloves 4. Respirators 5. Hair bands 6. Machine guards 7. Aprons
5. Demonstrate the correct use of the safety aids found in the lab.	Insist that students use protective devices when needed.	
6. Demonstrate a knowledge of the organization of the lab.	Emphasize the importance of orderliness and safety in the Industrial Arts lab. Identify and discuss the purpose of separating work and storage areas.	
7. Identify and accept responsibility for housekeeping practices.	Point out that good housekeeping practices aid in preventing accidents.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
8. Locate the safety aids in the lab.	Review procedures related to first aid, fire and accidents, using posters to emphasize the procedures. Have students develop housekeeping habits by taking responsibility for daily clean-up.	

CAREER EXPLORATION (GR101-02)

Major Objective: To familiarize students with the occupational characteristics of the graphics industry by providing information on how to enter, receive training for and advance within the graphics industry.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. INDUSTRIAL STRUCTURE The student should be able to:		
1. Describe the structure and purpose of each level of a graphics reproduction company.	Have students prepare a report outlining the structure of a graphics reproduction company and the types of printing services which may be found in that company.	Structure of Graphics Company 1. Upper Level - Management 2. Lower Level - Management 3. Craft Level Printing Technology, Breton Publishers, Chapter 2 Graphic Reproduction, Bennett Publishing, Chapter 2
2. Distinguish between the seven different types of printing services commonly available.	Have students form groups of 3-4, and have each group present a visual/graphic report to the class discussing the various types of printing services.	Printing Services 1. Commercial Printing 2. Special Purpose 3. Quick Service 4. In-Plant 5. Publishing 6. Package Printing 7. Trade Shops Printing Technology, Breton Publishers, Chapter 2

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. EDUCATION The student should be able to:		
1. Describe the function of employees in six major job classification areas of the graphics industry.	Have students research the function of graphics reproduction industry employees and prepare a bulletin board with the career information.	Examples of Major Job Areas 1. Composing 2. Photoengraving 3. Electrotyping and Sterotyping 4. Press Operatoring 5. Lithography 6. Bindery 7. Offset 8. Screen Printing Graphic Reproduction, Bennett Publishing, Chapter 2
2. Explain the educational requirements for an individual in any of the six major job classification areas of the graphics industry.	Have students assess the extent to which technological change may affect employment opportunities and occupational requirements.	Graphic Reproduction, Bennett Publishing, Chapter 2 Photo-Offset Lithography, Goodheart-Willcox, Unit 2
3. Determine if educational programs are available locally to assist in gaining entry to the graphics industry.	Arrange outside resources, such as: 1. Guest Speakers; 2. Career Counsellors; 3. Field Trips.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 2 Colleges, universities and trade associations

DESIGN (GR101-03)

Major Objectives: To develop an understanding of the elements and principles of design and their relationship to the graphic arts.
To use the elements and principles of design in preparing layouts.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. DESIGN ELEMENTS The student should be able to:		
1. Recognize the fundamental elements of design.	Have students collect newspaper/magazine ads and instruct them to identify the elements of design within the ads.	Elements of Design 1. Dot 2. Line 3. Tone (Value) 4. Color 5. Texture 6. Shape 7. Space
2. Incorporate the elements of design into a particular project.	Have students prepare a poster for an event (sports, fashion, drama, music) incorporating the elements of design. Alternates: Yearbook cover, book jacket, record album, calendar, logo.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit I3 Graphic Reproduction, Bennett Publishing, Chapter 5
3. Explain the effect of design elements on the finished copy.	Have students explain how each element contributes to the ad.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. DESIGN PRINCIPLES The student should be able to: 1. Define the basic principles of design.	Have students identify the design principles used in a commercially prepared graphic.	Principles of Design 1. Balance 2. Proportion 3. Rhythm 4. Harmony 5. Unity 6. Contrast
2. Explain the effect of design principles on a finished copy.	Have students analyze a commercially prepared graphic to determine how design principles make the graphic effective. Consider the purpose of the graphic, the targeted client or market, and the reasons why the graphic is effective.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
C. DESIGN STEPS The student should be able to:		
1. List the design steps used to prepare a completed print.	Discuss each of the five steps in the design process.	Steps in Design 1. Thumbnail sketch 2. Rough layout 3. Comprehensive layout 4. Final layout 5. "Dummy" preparation Printing Technology, Breton Publishers, Chapter 3 Graphic Communications, McKnight, Unit 2
2. Prepare a thumbnail sketch.	Have students use the five design steps to prepare a poster, business card, or brochure.	Thumbnail sketch Sketches consisting of design ideas only.
3. Prepare a rough layout.		Rough layout Shows the inter-relationship of the design components.
4. Prepare a comprehensive layout.		Comprehensive layout Shows detail and colouring of the final copy.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. Prepare a final layout.		
6. Prepare a "dummy".		"Dummy" A duplicate of the finished copy.
7. Develop an appreciation for properly designed work.	Have students prepare a critique of a graphic design, using a pre-established set of criteria and a rating scale for each criterion.	
8. Explain the relationship between design and production methods.	Discuss how design principles dictate the method of production. For example: 1. Why newspapers are not produced by the screen printing process; 2. Why textiles are screen printed.	Graphic Communications, McKnight, Chapter 2 Graphic Reproduction, Bennett Publishing, Chapter 5 Graphic Arts Fundamentals, Goodheart-Willcox, Chapter 13
9. Explain the concept of and advances within computer assisted design.	Point out that the process of design and the production or construction of many things are becoming increasingly complex. Have students research current design techniques and identify how they help integrate planning, designing and production.	

IMAGE GENERATION (GR101-04)

Major Objective: To develop an understanding of the different methods of image generation and to use these methods in preparing a layout.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. DRY TRANSFER The student should be able to:		
1. Identify examples of dry transfer processes.	Show students examples of dry transfer. Have students collect examples of graphics which may have been prepared by the dry transfer method.	Examples of Dry Transfer 1. Rub-on Lettering 2. Preprinted symbols
2. Use a dry transfer process in the preparation of a layout.	Demonstrate the use of dry transfer materials. Have students prepare a memo pad layout using dry transfer material.	Graphic Reproduction, Bennett Publishing, Chapter 6 Graphic Communications, McKnight, Section II Graphic Arts Fundamentals, Goodheart-Willcox, Unit 6 Printing Technology, Breton Publishers, Chapter 4

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. PEN AND INK The student should be able to:		
1. Describe three pen and ink methods of image generation.	Show students examples of three methods of pen and ink image generation.	Pen & Ink Methods of Image Generation 1. Speedball 2. Rapidograph 3. Lettering Templates Printing Technology, Breton Publishers, Chapter 4
2. Produce a layout using a pen and ink method of image generation.	Have students prepare a layout which may be incorporated into the preparation of a poster relating to safe practices in the lab. Have students trace a drawing from a newspaper/ magazine onto vellum.	
C. STRIKE ON The student should be able to:		
1. Explain the operation of three types of strike on devices.	Illustrate the operation of the various machines using the strike on method.	Strike On Methods 1. Typewriters 2. Varitypers 3. Varigraph Headliner

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
		Printing Technology, Breton Publishers, Chapter 4 Graphic Reproduction, Bennett Publishing, Chapter 6
2. Differentiate between proportional and constant spacing.	Have students find examples of proportional and constant spacing.	Proportional Spacing Allows for a variable amount of space between words and letters. Constant Spacing Provides a fixed space between all words and letters.
3. Illustrate the use of justified text.	Have students find examples of justified text.	Justification The process of composing lines of equal length, and where both left and right margins are consistent.
4. Prepare a layout using a strike on process.	Have students produce a table of contents page for a notebook or term paper from another course.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
D. COMMERCIALLY PREPARED COPY COMPONENTS The student should be able to:		
1. Identify uses of commercially prepared copy components.	Show students examples of commercially prepared copy components: i.e., clip art, border designs, rule tape.	
2. Use commercially prepared copy components.	Have students incorporate commercially prepared copy components into making a memo pad.	

LAYOUT (GR101-05)

Major Objectives: To recognize how various lettering styles affect a layout.
To use the tools and equipment of the layout artist to prepare a layout and a paste-up.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. LETTERING The student should be able to:		
1. Idenitfy the basic lettering styles.	Have students collect and identify examples of the basic lettering styles.	Basic Lettering Styles 1. Text 2. Roman 3. Italic 4. Script Graphic Reproduction, Bennett Publishing, Chapter 5
2. Describe the features of six typeface classifications.	Provide and/or have students collect examples of various typeface classifications.	Typeface Classifications 1. Roman 2. Sans Serif 3. Square Serif 4. Text 5. Script 6. Occasional Printing Technology, Breton Publishers, Chapter 3 Graphic Reproduction, Bennett Publishing, Chapter 5
3. Explain the uses of the styles of lettering.	Provide examples demonstrating the appropriateness of a type style. Include a discussion of characteristics attributed to a particular type style, i.e., the appeals intended, etc.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Identify tools associated with the lettering process.		
5. Use the tools in preparing a lettering layout.	Have students prepare a title page layout for their notebooks by using lettering tools.	Lettering Tools 1. Pens 2. Ink 3. Scales 4. T-Square 5. Triangles Graphic Reproduction, Bennett Publishing, Chapter 5
B. MEASUREMENT The student should be able to:		
1. Explain how type is measured by using the point system.	Have students prepare a diagram illustrating the relationship between an inch, a pica, a nonpareil, an agate and a point.	Point System 1 point = approx. 1/16" 1 pica = 12 points 6 points = 1 nonpareil 5½ points = 1 agate Line Gauge A device used to measure type; usually graduated in inches, picas and points.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
		Graphic Reproduction, Bennett Publishing, Chapter 3 Printing Technology, Breton Publishers, Chapter 3
2. Demonstrate the ability to take measurement in the Imperial and the Metric system of measurement.	Have students complete a worksheet. Have students record their heights in both Imperial and Metric measures. Note: Stress the use of metric measurement wherever possible.	
3. List the point sizes of body type.	Explain where body type is used. Have students find examples of body type.	Body Type Sizes 6,7,8,9,10,11,12,72 points Printing Technology, Breton Publishers, Chapter 3
4. List the point sizes of display type.	Explain where display type is used. Have students find examples of display type.	Display Type 12 points and larger Graphic Arts Fundamentals, Goodheart-Willcox, Unit 5

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
C. TOOLS AND EQUIPMENT The student should be able to: 1. Identify the tools associated with the layout process.		Layout Tools 1. T-Square 2. Triangles 3. Layout Paper 4. Pencils 5. Erasers 6. Line Gauge 7. Crayons 8. Compass 9. Ink 10. Pens 11. Fixative 12. Light Table
2. Demonstrate the correct use of the tools associated with the layout process.	Have students prepare a layout for the table of contents page in their notebooks.	Graphic Reproduction, Bennett Publishing, Chapter 5
D. PASTE-UP The student should be able to: 1. Identify the tools associated with the paste-up process.		Paste-up Tools 1. Straight Edge 2. Knives 3. Burnishers 4. Pen & Ink 5. Waxer & Wax 6. Glues 7. Cements 8. Non-repro Pencils

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
		Printing Technology, Breton Publishers, Chapter 5
2. Demonstrate the correct use of these tools in the paste-up process.		Printing Technology, Breton Publishers, Chapter 5
3. Describe the steps for preparing a single color paste-up.		Steps For Preparing A Single Colour Paste-up 1. Mounting the board 2. Adding layout lines 3. Attaching the copy
4. Describe the steps in preparing a mask.		Mask Any material that blocks the passage of light.
5. Prepare a single color paste-up.	Have students prepare a paste-up of a cover page for their notebook, a poster, or some project of their choice.	Printing Technology, Breton Publishers, Chapter 5

RELIEF PRINTING (GR101-06)

Major Objective: To gain knowledge and skills in the area of graphics defined as relief printing.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. INTRODUCTION The student should be able to: 1. Outline the history of the development of moveable type.	Have students prepare a timeline illustrating the development of moveable type.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit I
2. Define the term relief printing.		Relief Printing Reproduction method in which the image area is raised above the non-printing area. Also known as letterpress printing.
B. SIGN PRESS The student should be able to: 1. Describe the intended use of the sign press.		Sign Printing Printing of relief letters larger than 24 points.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Prepare a layout suitable for production on the sign press.		
3. Review the function of the sign press and the safe use of the equipment.		
4. Produce a print using the sign press.	Have students prepare a single color poster, accompanied by a critique of the finished graphic.	
5. Analyze a finished print with the intent of correcting problems associated with the use of the poster printer.		
6. Demonstrate the proper procedure for the clean-up of the equipment associated with the poster printer.	Make students aware of the importance of cleaning up after each use of the equipment.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
C. LETTERPRESS The student should be able to:		
1. Identify the parts of a piece of moveable type.	Have students label a diagram of a piece of moveable type.	Parts of Type 1. Face 2. Counter 3. Shoulder 4. Beard 5. Feet 6. Groove 7. Nick 8. Pin Mark 9. Height to Paper
2. Describe the characteristics of at least two type faces.	Provide students with examples on the overhead/ slides. Using the projections, review the characteristics unique to effective type faces.	
3. Explain the system by which spacing material is organized.	Have students prepare a diagram showing the relationship of the various types of spacing material.	Spacing Material 1. Quads a) EN b) EM c) 2-EM d) 3-EM 2. Spaces a) 3-EM b) 4-EM c) 5-EM Graphic Arts Fundamentals, Goodheart-Willcox, Unit 5

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Differentiate between leads and slugs with regard to their intended use.		Lead Line spacing that is 2 points thick. Slug Line spacing that is 6 points thick. Graphic Reproduction, Bennett Publishing, Chapter 7
5. Prepare a layout suitable for production on the letterpress.		
6. Set and proof type.		
7. Justify a line of type.	Have students prepare a business card/ticket/ identification card using moveable type and the platen press. Have students submit a critique of the finished graphic.	Graphic Reproduction, Bennett Publishing, Chapter 21 Printing Technology, Breton Publishers, Chapter 17
8. Lock-up a type form.		
9. Operate the letterpress in a safe manner.		

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
10. Produce a print of acceptable quality using the letterpress.		
11. Analyze a letterpress print with the intent of overcoming problems associated with the letterpress equipment or its operation.		
12. Demonstrate the proper procedure for the clean-up of the press and its associated equipment.		
13. Redistribute type.	Stress the need to take care in storing type for the sake of ready access in the future.	
D. RUBBER STAMP		
The student should be able to:		
1. Explain the use of a rubber stamp.	Have students list situations in which the use of a rubber stamp is appropriate.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Prepare a layout suitable for conversion into a rubber stamp.		
3. Describe the equipment required to produce a rubber stamp.		Rubber Stamp Equipment 1. Special Type 2. Matrix Moulding Board 3. Unvulcanized Rubber 4. Rubber Stamp Press 5. Chase Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11
4. Produce a matrix from set type.		
5. Produce a finished rubber stamp from a matrix.		
6. Operate the equipment associated with the production of a rubber stamp in a safe fashion.		

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
7. Solve problems related to the operation of the rubber stamp equipment.	Have students prepare a rubber stamp along with a critique of the finished item.	
8. Properly cleanup the rubber stamp making equipment.		
9. Redistribute type.		

SCREEN PRINTING (GR101-07)

Major Objectives: To recognize the significance of screen printing.
To develop the skills necessary to prepare and print hand-cut and photographic film stencils.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. HAND-CUT FILM STENCILS The student should be able to:		
1. Outline the history of the development of hand cut film.	Have students prepare a timeline illustrating the development of hand cut film.	Printing Technology, Breton Publishing, Chapter 14
2. Describe the general theory of the screen printing process.	Have students explain the screen printing process by referring to the materials and equipment used in the process.	Screen Printing A form of stencil printing.
3. List the uses of the screen printing process.	Have student prepare a list of items produced by using the screen printing process.	
4. Demonstrate the safe use of the tools and materials associated with the screen printing process.		

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. Prepare a screen printing frame.	Have students prepare a screen printing frame requiring fabric stretching and the fabric treatments of degreasing and roughening.	Printing Technology, Breton Publishers, Chapter 14 Graphic Reproduction, Bennett Publishing, Chapter 24
6. Describe the function of the tools and materials used in screen printing.	Have the students state the function of each piece of equipment.	Screen Printing Tools and Materials 1. Screen Material 2. Frame 3. Squeegee 4. Inks 5. Solvents 6. Knives Printing Technology, Breton Publishers, Chapter 15
7. Produce a hand cut stencil.	Demonstrate the use of various cutting tools--X-acto knife, swivel knife, double line cutters and circle cutters.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 8 Graphic Reproduction, Bennett Publishing, Chapter 24
8. Prepare a screen print from a hand cut stencil.	Have students prepare a single color print using a hand cut stencil.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 8

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
9. Understand the composition and properties of screen printing inks.	Have students describe the composition and properties of screen printing inks.	Composition of Screen Printing Ink 1. Vehicle 2. Binder 3. Pigment (This ink must be capable of freely passing through screen fabric and still placing an image of acceptable density on the receiving surface.) Graphic Reproduction Bennett Publishing, Chapter 26
10. Identify ink types and their uses.	Have students prepare a list of ink types and their uses, including inks for the poster printer, platen press, and screen printer.	Graphic Reproduction, Bennett Publishing, Chapter 26
11. Analyze a screen print with the intent of overcoming problems associated with the screen printing process.	Have students prepare a critique of their finished work and explain to the class the features of their work.	Printing Technology, Breton Publishers, Chapter 15
12. Demonstrate the correct clean-up procedure.	Illustrate the correct and safe use of the solvents required for clean-up. Point out that the screen can be stored with the stencil left on it if the need to rerun the job at future date is anticipated.	Printing Technology, Breton Publishers, Chapter 15 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 8

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. PHOTOGRAPHIC FILM STENCILS The student should be able to:		
1. Explain the theory of the action of the photographic film stencil.	Have students prepare a diagram illustrating the action of a photographic film stencil.	Theory of Action Any area of the stencil receiving light is hardened during exposure. During washout the remaining areas are washed away to create the open or image areas.
2. Prepare a transparency suitable for exposing a photographic film stencil.	Have students prepare a single color photographic stencil print. Upon completion, have students critique their work.	Printing Technology, Breton Publishers, Chapter 14 Graphic Reproduction, Bennett Publishing, Chapter 24
3. Properly expose a photographic film stencil.		
4. Develop, washout, and adhere a photographic film stencil.		
5. Print a photographic film stencil.		

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
6. Analyze a print produced by a photographic film stencil with the intent of overcoming any problems associated with the use of the photographic film stencil. 7. Demonstrate the correct clean-up procedure.		
C. P.M.T. RECEIVER FILM The student should be able to: 1. Identify the parts of a copy camera.	Have students label a diagram of a copy camera.	Parts of a Copy Camera 1. Vacuum Film Holder 2. Copyboard 3. Bellows 4. Ground Glass 5. Lens Diaphragm 6. Lens 7. Lights Graphic Reproduction, Bennett Publishing, Chapter 10 Printing Technology, Breton Publishers, Chapter 6 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 6

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Outline the differences between line and continuous tone copy.	Have students provide an example of each type of copy.	Line Copy Any image made only from lines, such as type and clear inked drawings. Continuous Tone Copy Images created from many different tones or shades.
3. Explain the theory of photography.	Discuss how light is reflected from an object and the differing intensities reflected from the object. Discuss the change of color in silver halides upon exposure to light.	Printing Technology, Breton Publishers, Chapter 6 Graphic Reproduction, Bennett Publishing, Chapter 10 Photo- Offset Fundamentals, McKnight
4. Expose a P.M.T. transparency.	Demonstrate the correct procedure for the production of a P.M.T. transparency. Explain the use of the proportional scale.	
5. Process a P.M.T. transparency.		

CONTINUOUS TONE PHOTOGRAPHY (GR101-08)

Major Objectives: To recognize the principles of continuous tone photography.
To develop skills in the use of equipment related to continuous tone photography.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. COMPOSITION The student should be able to:		
1. Explain the principles of composition as they relate to continuous tone photography.	Provide examples of photographic composition principles. Use Kodak slides series, "Rules of Photographic Composition".	Composition The arranging of the parts of a picture into a harmonious and pleasing situation. Basic Principles of Composition 1. Simplicity 2. Balance 3. Rule of Thirds 4. Lines 5. Frames 6. Mergers Photo One: Basic Photo Text, Prentice Hall Exploring Photography, Goodheart-Willcox, Chapter 6
2. Define four compositional effects.	Have students collect examples of different photographs (i.e., advertisement layouts) to show and discuss compositional effects.	Compositional Effects 1. Harmony 2. Unity 3. Balance 4. Variety

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. CAMERAS The student should be able to:		
1. Explain the theory of light transmission.	Using the lecture method and visual supports, explain the theory of light transmission generally, then specifically with reference to cameras.	Exploring Photography, Goodheart-Willcox, Chapter 3
2. Describe the operation of a pinhole camera.	Have students produce a pinhole camera. For the sake of simplicity, the camera back may be made of vellum.	Exploring Photography, Goodheart-Willcox, Chapter 3
3. Differentiate between viewfinder, rangefinder, and reflex cameras.	Use slides and provide examples of the various types of cameras. Include a discussion of the parallex error.	Parallex Error When the object being photographed is too close to the camera the viewfinder sees the subject from a slightly different position than the lens. Exploring Photography, Goodheart-Willcox, Chapter 4

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Explain the function of the parts of a single lens reflex camera.	Have students label a diagram of a camera.	Reflex Camera Parts 1. Lens 2. Penaprism 3. Eyepiece 4. Field lens 5. Ground glass viewing screen 6. Mirror 7. Focal plane shutter 8. F-stop ring 9. Depth of field scale 10. Light meter 11. Shutter speed indicator Exploring Photography, Goodheart-Willcox, Chapter 4
5. Describe two special purpose cameras.	Have students find advertisements for special purpose cameras and post them on a bulletin board in the classroom.	Special Purpose Cameras 1. Waterproof camera 2. Polaroid camera 3. Other

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
C. BLACK AND WHITE FILM PROCESSING The student should be able to:		
1. Describe the use of the equipment used in film processing.	Have students list the function of the equipment used in the processing of black and white film.	Film Processing Equipment and Materials 1. Tanks 2. Timer 3. Thermometer 4. Developer 5. Stop bath 6. Fixer 7. Water
2. Identify the characteristics of black and white film with respect to size and speed.	Have students describe the effect of various film speeds on lighting conditions and exposure times. Have students prepare a list of various film sizes.	Common Film Sizes 1. 110 2. 120 3. 126 4. 135 Exploring Photography, Goodheart-Willcox, Chapter 5

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. List the steps in processing black and white film.	Do a lights on demonstration using already exposed film.	Film Processing Steps 1. Load the tank 2. Check solution temperatures and adjust if necessary 3. Pour developer into tank 4. Agitate as required 5. Stop developing at correct time and pour out developer 6. Pour in stop bath 7. Replace stop bath with fixer 8. Agitate 9. Wash film 10. Hang to dry
4. Process a film.	Have students shoot a film using the principles of photo composition and then process the film.	
5. Analyze the results of the processing with the intent of overcoming problems associated with processing.	Have students prepare a critique of their processed film.	Exploring Photography, Goodheart-Willcox, Chapter 9
D. ENLARGING The student should be able to:		
1. Explain the use of the equipment required to make an enlargement.	Have students explain the use/function of the equipment required to make an enlargement.	Photo-Enlarging Equipment 1. Photo paper 2. Enlarger

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
		3. Developer 4. Stop bath 5. Fixer 6. Focusing aids 7. Timer 8. Safe lighting
2. Discuss two different types of enlargers and identify their parts.	Have students compare and contrast two types of enlargers.	Types of Enlargers 1. Condenser - uses condensing lens 2. Diffusion - uses ground glass
3. Discuss the identifying characteristics of projection papers.	Have students prepare a poster showing the various types of projection papers available.	Characteristics of Projection Papers 1. Resin coated papers 2. Projection vs Contact papers 3. Size 4. Color 5. Weight 6. Texture 7. Contrast Exploring Photography, Goodheart-Willcox, Chapter 10
4. Prepare a proof using the contact printing process.	Demonstrate the procedures used in the contact printing process. Include the use of a test strip to determine correct exposure time.	Exploring Photography, Goodheart-Willcox, Chapter 10

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. Prepare a test strip.		Test Strip An exposure made for the sole purpose of determining the proper exposure time.
6. Analyze a test strip.		Exploring Photography, Goodheart-Willcox, Chapter 10
7. Prepare a projected print.		
8. Analyze a projected print with the intent of overcoming problems associated with projection printing.	Have students prepare a critique of their completed projection prints.	
9. Demonstrate the correct method of clean-up.		
10. Dry and mount a projected print.	Have students mount one of their projection prints.	Exploring Photography, Goodheart-Willcox, Chapter 15

LITHOGRAPHY (GR101-09)

Major Objectives: To recognize the significance of lithography to the graphics industry.
To gain knowledge about and to develop skill in the lithographic process.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. OFFSET PRINCIPLES The student should be able to:		
1. Outline the theory of planographic printing.	Have students attempt to mix an oil based ink with water.	Planographic Printing Lithography means "stone writing". Lithographic process developed in 1798 by Alois Senefelder. Photo-Offset Lithography, Bennett Publishing, Chapter 1 Photo-Offset Fundamentals, McKnight, Chapter 2
2. Describe the four basic systems of the offset press.	Have students explain the function of each system of the offset press.	Systems of Offset Press 1. Feed 2. Ink 3. Water 4. Delivery Photo-Offset Fundamentals, McKnight, Chapter 16

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. Identify the three major cylinders of the offset press.	Have students label a diagram of an offset press.	Major Cylinders of Offset Press 1. Plate cylinder 2. Blanket cylinder 3. Impression cylinder Photo-Offset Fundamentals, McKnight, Chapter 16
4. Make operating adjustments to the offset press.	Have students make a "no ink" feed and delivery run. Discuss the parts of the offset press which can be adjusted, and describe the effect of adjusting each part. Demonstrate the effect of adjusting the press.	Photo-Offset Lithography, Goodheart-Willcox, Chapter 9 Printing Technology, Breton Publishers, Chapter 13 Photo-Offset Fundamentals, McKnight, Chapter 18
5. Prepare a direct image/ electrostatic offset plate.		Photo-Offset Lithography, Goodheart-Willcox, Chapter 8
6. Produce a print by operating the press in a safe manner.	Have students prepare a memo pad or calendar.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
7. Analyze a print produced on the offset press with the intent of overcoming any problems associated with the operation of the press.	Request students to prepare a critique of their completed work.	Printing Technology, Breton Publishers, Chapter 13, Section 2 Photo-Offset Fundamentals, McKnight, Chapter 19
8. Demonstrate the proper method of clean-up on the offset press.		
9. List the characteristics of offset inks.	Have students list the characteristics of offset inks.	Characteristics of Offset Inks 1. Must have body 2. Must be strong in color 3. Must have tack (stickiness) 4. Must have a drier 5. Must not emulsify (absorb any of the fountain solution) 6. Must not weaken the plate image or cause "scumming" Graphic Reproduction, Bennett Publishing, Chapter 26 Printing Technology, Breton Publishers, Chapter 20, Section 2 Photo-Offset Fundamentals, McKnight, Chapter 14

BINDING AND PACKAGING (GR101-10)

Major Objectives: To recognize the significance of binding and packaging.
To develop knowledge and skill in the area of binding and packaging.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. PADDING The student should be able to:		
1. Describe various types of binding used in the bookbinding industry.	Have students list an example of each type of binding process. Show and explain to the class examples of each type of binding.	Types of Binding 1. Edition Binding 2. Adhesive Binding 3. Mechanical Binding 4. Coil Binding 5. Looseleaf Binding
2. Prepare a simple pad using rubberized padding compound.	Have students pad their prints of a memo pad.	
3. Explain the process of perfect binding.	Have students explain why the perfect binding process is used.	Perfect Binding Sheets of paper are held together with a flexible cement. Books bound in this fashion lie flat when open, i.e., telephone directories, magazines.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Describe the use of "crash" in the book-binding operation.	Provide students with examples of binding.	Crash A layer of gauze glued to the spine of a book to provide additional support.
5. Properly and safely trim a pad.		
B. STAPLING The student should be able to:		
1. Explain the difference between side binding and saddle stitching.	Have students provide examples of materials which are side bound and saddle stitched.	Side Binding Sheets are gathered side by side. Side binding requires that extra paper be allocated to the backbone just for the binding. Saddle Stitching Signatures straddle the binding device. Saddle bound signatures normally require a lip because they are placed inside each other. Printing Technology, Breton Publishers, Chapter 21

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Describe two methods of applying covers.	Ask students to explain the reason for having two methods. Have students provide examples of where each type of covering is used. Discuss the appropriateness of each cover type in a particular situation.	Cover Methods 1. Soft Cover 2. Casebound Cover Printing Technology, Breton Publishers, Chapter 21
C. CORNERING The student should be able to:		
1. Explain the reason for the cornering operation.	Provide students with notes and examples. If possible, have students incorporate cornering into their note pad project.	Graphic Reproduction, Bennett Publishing, Chapter 23
2. Describe the steps in the cornering operation.		Graphic Reproduction, Bennett Publishing, Chapter 23

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
D. PAPER The student should be able to:		
1. Describe the paper manufacturing procedure.	Have students "make" a sheet of paper.	Printing Technology, Breton Publishers, Chapter 20, Section 1 Photo-Offset Lithography, Goodheart-Willcox, Unit 11 Photo-Offset Fundamentals, McKnight, Chapter 15
2. Describe the properties of paper and the importance of the selection process.	Exhibit samples from a paper supply company. Have students comment on the appropriateness of a paper for a particular use.	Graphic Reproduction, Bennett Publishing, Chapter 25
E. PAPER CUTTER The student should be able to:		
1. Identify the procedure of operating a paper cutter.	Emphasize the safe operation of the paper cutter.	Printing Technology, Breton Publishers, Chapter 21
2. Operate a paper cutter safely.	Have students trim paper stock, card stock, or some project to be mounted.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. PRESS TYPES The student should be able to:		
1. Distinguish between the two major types of offset presses.	Have students prepare a report on two types of offset presses,including a description of the type of work for which each press is used.	Types of Offset Presses 1. Web 2. Sheet Fed Photo-Offset Lithography, Bennett Publishing, Chapter 12
2. Identify those pieces of equipment which are classified as "duplicators".	Identify those pieces of equipment which are classified as "duplicators".	Press vs Duplicator The differentiation between an offset press and an offset duplicator is made on the basis of the maximum sheet size the press will feed. Machines which handle stock up to 297 x 420 mm (11"x 14") are called duplicators; those handling large stock are called presses.

PROCESS PHOTOGRAPHY (GR101-11) Option

Major Objectives: To recognize the significance of process photography.
To develop knowledge about and skills in the area of process photography.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. LINE PHOTOGRAPHY The student should be able to:		
1. Define line photography.	Provide examples of line photography.	Line Photography The process of recording high contrast images on pieces of film. Line negatives are either clear in the image area or solid black in the non-image areas.
2. Describe the composition of a piece of lithographic film.	Have students label a cross-sectional view of a piece of lithographic film.	Litho-Film Composition 1. Protective overcoat 2. Emulsion 3. Base 4. Antihalation backing Photo-Offset Fundamentals, McKnight, Chapter 8
3. Explain the theory of exposure of a lithographic film.	Provide students with notes. Have students prepare a diagram illustrating the theory of exposure.	Printing Technology, Breton Publishers, Chapter 6 Photo-Offset Fundamentals, McKnight, Chapter 8

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Outline the use of the adjustments on a process camera.	Have students label a diagram of the process camera. Using a camera, demonstrate the techniques involved in the use of adjustments.	Printing Technology, Breton Publishers, Chapter 6 Graphic Reproduction, Bennett Publishing, Chapter 10 Photo-Offset Fundamentals, McKnight, Chapter 8
5. Describe the use of a gray scale.	Have students use a gray scale in exposing a lithographic negative.	Gray scale An aid to determining the proper development of a piece of lithographic film.
6. Prepare a lithographic negative.	Use one of the paste-ups that the students have already completed.	Printing Technology, Breton Publishers, Chapter 6 Graphic Reproduction, Bennett Publishing, Chapter 10 Photo-Offset Fundamentals, McKnight, Chapter 8
B. P.M.T. PROCESS		
The student should be able to:		
1. State the complete name given to the P.M.T. process.		P.M.T. Photo Mechanical Transfer

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Describe the diffusion transfer process.	Have students collect technical data from a film manufacturer for their reports on the diffusion transfer process.	Diffusion Transfer Process The negative sheet is placed in a processor camera and exposed to the original copy. The exposed negative is then placed in contact with a receiver sheet and passed through an activator chemical. The silver in the area not exposed transfers to the receiver sheet making an exact replica of the original copy.
3. List the steps involved in preparing a P.M.T. print.	Have students make a poster listing the steps involved in preparing a P.M.T. print.	P.M.T. Steps 1. Set camera 2. Expose negative 3. Process negative and receiver paper 4. Wash print
4. Process a P.M.T. print.	Have students prepare a print suitable for use in a paste-up.	
5. Analyze a P.M.T. print with regard to over-coming problems associated with the process.	Make students aware that the problems of over/under exposure manifest themselves in a manner opposite to problems encountered in lithographic/continuous tone film processing.	

graphics 201

GRAPHICS 201

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01 Student Orientation and Safety	C	81 - 82
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Minimum of <u>one</u> of the following: (Core)		
06 Continuous Tone Photography	O	110 - 114
07 Relief Printing	O	115 - 116
08 Binding and Packaging	O	117 - 125

ORIENTATION AND SAFETY (GR201-01)

Major Objectives: To explore the significance of graphic arts in meeting the students' personal needs as well as the needs of the larger community.
To develop an attitude in the students allowing them to work effectively and safely with the materials and equipment used in graphic arts.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. PROGRAM REVIEW The student should be able to:		
1. Define graphic arts.	Have students prepare their own definitions of graphic arts. Compare their definitions with more widely accepted definitions.	Graphic Arts Printing and allied crafts, including papermaking, binding and photography.
2. Explain the purposes of studying graphics.	Illustrate to students the impact that graphics have on their daily lives. Use various examples such as: 1. Newspapers 2. Textbooks, magazines 3. Television graphics 4. Advertising signs 5. Billboards 6. Packaging	
3. List the events leading to the development of the graphics process.	Have students prepare a timeline and short essay representing the development of the graphics processes.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 1

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Identify the four processes central to the graphics industry.	Have students prepare definitions of each of the four processes. Discuss and show examples of each process.	Processes Central to Graphics Industry 1. Letterpress 2. Gravure 3. Screen Printing 4. Lithography Graphic Reproduction, Bennett Publishing, Unit 1
5. Describe the various methods used to copy graphic images.	Show examples of material copied by various methods.	Copying Processes 1. Continuous Tone 2. Microfilm/Microfiche 3. Blueprints 4. Electrostatic Copies Graphic Reproduction, Bennett Publishing, Unit 1
6. Explain the communication model.	Define source, message, medium and receiver, explaining how these components constitute a communication model. Emphasize that without feedback, the communication is incomplete and that dialogue is necessary.	Communication Model Source → Message → Medium → Receiver Feedback Printing Technology, Breton Publishers, Chapter 1

IMAGE GENERATION (GR201-02)

Major Objectives: To gain an understanding of the importance of image generation techniques.
To develop skills using these techniques in preparing layouts.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. P.M.T. The student should be able to:		
1. Identify the parts of a process camera.	Ask students to identify and label the parts of a process camera shown in a diagram.	Basic Parts of a Process Camera 1. Lens 2. Bellows 3. Camera Back 4. Copy Board 5. Lights
2. Determine the enlargement and reduction for camera copy.	Provide students with a worksheet containing enlargement and reduction problems to be calculated by means of percentages.	Englargement-Reduction Methods 1. By use of a proportional scale 2. By formula: Original size Photo-Offset Fundamentals, McKnight, Chapter 7 Printing Technology, Breton Publishers, Chapter 5 Graphic Communications, McKnight, Section 2
3. Differentiate between the types of light sensitive films used in the P.M.T. process.	Have students explain the use/function of each type of film.	P.M.T. Films 1. P.M.T. negative 2. P.M.T. receiver film 3. P.M.T. receiver paper

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Explain the theory of the dye transfer process.	Require students to collect technical data from a film manufacturer as a resource for their reports outlining the dye transfer process.	
5. Make the appropriate camera settings required to expose a P.M.T. negative.	Ask students to list those camera elements which will require setting in order to expose a P.M.T. negative.	Camera Adjustment Features 1. Copy size 2. Exposure time Graphic Communiations, McKnight, Section 9 Printing Technology, Breton Publishers, Chapter 6 Photo-Offset Lithography, Goodheart-Willcox, Unit 6
6. Process an exposed P.M.T. negative.	Have students prepare a P.M.T. print from a convenient copy. Have students convert a continuous tone photograph to a line shot using P.M.T. transparency.	
7. Examine a P.M.T. print with the intention of identifying and correcting any problems associated with the P.M.T. process.	Have students critque their work by checking for overexposure, underexposure and penholing.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. STRIP PRINTING The student should be able to:		
1. Describe the equipment and materials used to produce a strip print.	After providing the students with notes and/or a demonstration, have them label a diagram of the equipment. Display samples of various font sizes and styles.	Strip Printing Equipment 1. Strip printer machine 2. Developer 3. Fixer 4. Resin coated paper 5. Transparency Photo-Offset Fundamentals, McKnight, Chapter 5
2. Explain the steps involved in making a contact strip print.	Demonstrate the steps involved in strip printing. Have students prepare a strip print of their names.	Steps to Strip Printing 1. Register letter 2. Expose 3. Repeat steps 1 and 2 as often as required. 4. Develop 5. Fix 6. Wash The Basic Book of Graphic Arts, American Technical Society, Chapter 16

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. List the differences between the contact strip printing process and the projection strip printing process.	Instruct students to prepare a poster illustrating the strip printing and projection printing processes.	Printing Technology, Breton Publishers, Chapter 4 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 6 Photo-Offset Fundamentals, McKnight, Chapter 5 Introduction to Photo-Offset Lithography, Bennett Publishing, Chapter 7
4. Outline the process of photo typesetting.	Arrange a field trip to a photo typesetter. Have students prepare a sequenced procedure for photo typesetting.	Printing Technology, Breton Publishers, Chapter 4 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 6 Photo-Offset Fundamentals, McKnight, Chapter 5 Photo-Offset Lithography, Goodheart-Willcox, Unit 7

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
C. AIRBRUSH The student should be able to:		
1. Identify two types of airbrushes.	Label diagrams of the two types of air brushes. List the differences between the two types of airbrushes. Demonstrate the use of airbrushes.	Types of Airbrushes 1. Single Acting 2. Double Acting The Complete Airbrush Book, Leon Amiel Publisher The Airbrush Book: Art, History and Technique, Van Nostrand Reinhold Company The Advanced Airbrush Book, Van Nostrand Reinhold Company
2. Explain the airbrush operation theory.	Review and discuss Benouli's Principle (venturi principle).	Venturi Principle A narrowed passageway or restriction that increases the velocity of air moving through it and produces a vacuum responsible for the discharge from the nozzle.
3. List the types of ink suitable for use in an airbrush.	Have students dilute colors for airbrush use to the consistency of light cream. (Heavier colors will give a grainy effect as well as clog the airbrush.)	Types of Ink Water soluble - transparent - opaque - acrylic - textile

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Describe the use of masks in the airbrushing process.	Demonstrate the use of friskets adhered by rubber cement, as well as the use of prepasted friskets and cardboard masks.	
5. Outline the uses of the airbrushing process.		Uses of Airbrush Process 1. Cartoons 2. Product design 3. Poster design 4. Architectural rendering 5. Photo retouching 6. Glassware retouching 7. Cosmetic displays 8. Industrial finishes 9. Jewellery
6. Understand the dangers associated with the use of the airbrush and its supporting materials.	Advise students to demonstrate care in the selection and use of media. (Lacquer inks and certain acrylics are a potential respiratory hazard.)	
7. Set up the airbrush and compressor for proper operation.	Provide a demonstration of pressure adjustment, fine tuning of spray, and triggering technique.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
8. Create an illustration using an airbrush.	Practically every shape and surface airbrush artists encounter in their work is found in the five basic geometric forms: the sphere, cube, cone, cylinder and concave surface. Have students give these basic forms the illusion of three dimensional quality by experimenting with line, light and shade.	Stages of Complexity of Operation 1. Lines of varying widths 2. Dots 3. Gradation of tone 4. Simple masks 5. Geometric shapes 6. Complex masks

SCREEN PRINTING (GR201-03)

Major Objectives: To gain an understanding of the processes of photographic screen printing.
To develop skills related to photographic screen printing.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. PHOTO DIRECT SCREEN PRINTING The student should be able to:		
1. Outline the steps involved in coating a screen with photographic emulsion.	Demonstrate the steps to be used in coating a screen with photographic emulsion. Have students divide into groups, and ask them to replicate the demonstration.	Screen Coating Steps 1. Preparation of the sensitized emulsion 2. Application of the emulsion to the screen 3. Drying the emulsion Printing Technology, Breton Publishers, Chapter 14 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 8
2. List the steps involved in the exposure of a photo direct screen.		Methods of Exposure 1. Overhead exposure with glass plate 2. Plate burner with rubber mat
3. Describe the processing of a photo direct screen.		Printing Technology, Breton Publishers, Chapter 14 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 8

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Prepare a photo direct screen.	Use P.M.T. transparency to produce a screen print.	
5. Demonstrate the proper clean-up procedure associated with the printing process.	Note the potential health hazard associated with prolonged exposure to solvent. Emphasize the importance of thorough clean-up with regard to good housekeeping and safety practices.	
6. Solve problems associated with the photo direct screen printing process.	Have students critique their finished work with regard to: 1. Over coating 2. Under coating 3. Emulsion not properly sensitized 4. Under exposure 5. Over exposure 6. Poor wash out	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. PHOTO INDIRECT SCREEN PRINTING The student should be able to:		
1. List examples of indirect films and their uses.	Have students construct a chart illustrating the various types of indirect films and the uses of each type of film.	Examples of Photo Indirect Films 1. RX 200-300 2. XPM-2 3. Blue Poly 2 4. Super Prep 5. Hi-Fi Green 6. Hi-Fi Red 7. Nova Star (Autotype) Graphic Reproduction, Bennett Publishing, Chapter 24
2. Prepare a photo indirect stencil.	Use a pen to ink photographic or masking film producing a transparency. Film is to be exposed through the base.	
3. Produce a screen print using a photo indirect stencil.	Have students produce a single color screen print.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. Demonstrate the correct use of the safety aids found in the lab.	Insist that students use protective devices when needed.	
6. Demonstrate a knowledge of the organization of the lab.	Emphasize the importance of orderliness and safety in the Industrial Arts lab. Identify and discuss the purpose of separating work and storage areas.	
7. Identify and accept responsibility for housekeeping practices.	Point out that good housekeeping practices aid in preventing accidents. Have students develop housekeeping habits by assuming the responsibility for daily clean-up.	
8. Locate the safety aids in the lab.	Review procedures related to first aid, fire and accidents. Use posters to emphasize procedures.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. SAFETY The student should be able to:		
1. Explain the need for safe practices in the lab.	Discuss the reason for using practices which are considered safe.	Photo-Offset Lithography, Goodheart-Willcox, Unit 1 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 3
2. Differentiate between those behaviours which are considered safe and those which are not.	Have students prepare a poster illustrating (listing) practices which are considered to be safe.	
3. Outline the need for safe clothing in the lab.	Illustrate how various types of clothing can interfere with safe practices. Point out the hazards associated with loose clothing, long hair and long sleeves, jewellery. Invite students to participate in setting a dress code.	
4. Understand the need for and importance of protective devices.	Have students identify and explain the purpose of various protective devices.	Protective Devices 1. Safety glasses/goggles 2. Face shields 3. Gloves 4. Respirators 5. Hair bands 6. Machine guards 7. Aprons

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Demonstrate the proper method of clean-up associated with this screen printing process.	Have students explain the need for proper cleaning of the screen printing equipment.	
5. Evaluate a screen print with the intention of solving problems associated with this process.	Have students prepare a critique of their finished work.	
C. DIRECT/INDIRECT SCREEN PRINTING The students should be able to:		
1. Prepare a photo direct/ indirect stencil.		
2. Produce a screen print using a photo direct/ indirect stencil.		

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
D. MULTICOLOR SCREEN PRINTING The student should be able to:		
1. Prepare the positives which represent the color separations required.		Graphic Reproduction, Bennett Publishing, Chapter 24 Printing Technology, Breton Publishers, Chapter 15
2. Demonstrate the use of paper feeding guides.		
3. Explain the process of color registration.		
4. Prepare a multicolor screen print.	Have students prepare a multicolored decal of a cartoon character.	
5. Demonstrate the proper method of clean-up associated with this process.		Graphic Arts Fundamentals, Goodheart-Willcox, Unit 8 Graphic Arts, Bennett Publishing, Chapter 6 Graphic Communications, McKnight, Chapter 5

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
6. Evaluate a print to determine the source of and solution to any problems.	Ask students to critique their finished work, using the criteria and evaluation scheme provided.	
E. HEAT TRANSFER The student should be able to:		
1. Prepare a screen and stencil for printing a heat transfer.	Stress that the stencil for a heat transfer must be wrong reading (reverse).	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 9
2. Describe the types of ink used in the transfer process.	Instruct students to collect technical data from ink suppliers as a basis for a report.	Types of Ink 1. Fabric label direct inks 2. Plasticol transfer inks Graphic Arts Fundamentals, Goodheart-Willcox, Unit 9 Graphic Reproduction, Bennett Publishing, Chapter 24 Printing Technology, Breton Publishers, Chapter 20
3. Print a heat transfer on a piece of release paper.	Have students prepare a heat transfer of their names.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Demonstrate the correct method for curing the transfer.	Emphasize that heating time will vary depending upon the heat source, the type of ink and the thickness of the textile material.	
5. Transfer the print onto a piece of textile.	Explain the use of a bonding agent to aid in the transfer.	
6. Demonstrate the proper method of clean-up associated with this process.	Emphasize the importance of proper clean up of the materials associated with the heat transfer process.	
7. Evaluate a transfer to determine the source of and solution to any problems.	Have students prepare a critique of their work using an objective checklist with assigned values.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
F. VACUUM SCREEN PRINTING (Optional) The student should be able to:		
1. Demonstrate an understanding of the concept of vacuum screen printing.	Point out that this printing concept utilizes vacuum and atmospheric pressures to make an impression that can apply any number of colours at the same time. Arrange a field trip on which students can view the operation of vacuum screen printing equipment. Have students collect technical data on the vacuum screen printing process and prepare a report on the process.	Printing Technology, Breton Publishers, Chapter 15
2. Prepare a screen print.		
3. Evaluate a print to determine the source of and solution to problems.		
4. Demonstrate proper clean up methods associated with this process.		

PROCESS PHOTOGRAPHY (GR201-04)

Major Objectives: To gain an understanding of line and halftone photographic techniques.
To develp knowledge and skills in the area of process photography.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. REVIEW OF IMAGE GENERATION The student should be able to:		
1. Use the processes of image generation to prepare a paste-up.	Refer to the module Image Generation in Graphics 101. Have students prepare a paste-up suitable for reproduction by lithographic means.	Processes of Image Generation 1. Dry Transfer 2. Strike On 3. Pen and Ink 4. P.M.T. Print 5. Photo Composition 6. Commercially Prepared Copy Components
B. LINE NEGATIVES The student should be able to:		
1. Identify line copy.	Refer to the module Process Photography in Graphics 101. Have students collect examples of line copy.	Line Copy A copy that is black and white with no gradations of tone.
2. Describe the composition of lithographic film.		Photo-Offset Fundamentals, McKnight, Chapter 8 Introduction to Photo-Offset Lithography, Bennett Publishing, Chapter 9

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. Explain the function of the gray scale.	Have students read the gray scale on samples of exposed line negatives. Indicate to the class that the gray scale could also be called a sensitivity/developing guide.	Gray Scale A device used to check the many conditions that produce good negatives. These conditions include quality of light source, exposure time, developer temperature and exhaustion.
4. Expose a line negative.	Have students prepare a line negative.	Photo-Offset Fundamentals, McKnight, Chapter 8
5. Process a line negative.	Point out that agitation will keep the chemicals moving, continually supplying new developer to the surface of the film.	Photo-Offset Lithography, Goodheart-Willcox, Chapter 6
6. Adjust exposure time based on the gray scale.	Distribute a worksheet with various problems relating to exposure time and the gray scale.	Step — % of Basic Exposure 1 — 35 2 — 50 3 — 71 4 — 100 - Basic Exposure 5 — 141 6 — 200 7 — 280 8 — 400

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
7. Evaluate a line negative to determine the source of and solution of any problems.	Have students prepare critique their line negatives using an objective checklist with assigned values for each criterion.	
C. HALFTONE NEGATIVES The student should be able to:		
1. Identify continuous tone copy.	Point out that continuous tone photography is both an image generation process and a production process in the graphic communications industry. Have students collect examples of continuous tone copy.	Continuous Tone A copy such as a photograph which has gradations of tone from white to black.
2. Explain the use of a densitometer.	Have students use a densitometer on a black and white continuous tone photograph to assess the value of the highlight and shadow areas.	Densitometer A device for measuring optical density. There are two common types of densitometers: 1. Visual Type (Reflection Density Guide) 2. Photo Electric Type Photo-Offset Fundamentals, McKnight, Chapter 9 Graphic Reproduction, Bennett Publishing, Chapter 11 Printing Technology, Breton Publishers, Chapter 7

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. Describe the characteristics of a halftone screen.	Have students collect technical data from screen manufacturers for their reports on halftone screens.	HalfTone Screen A contact screen which consists of a pattern of vignetted, dotlike apertures. The vignetted dots vary in density from very light in the centre to dark near the edges. Graphic Reproduction, Bennett Publishing, Chapter 11 Printing Technology, Breton Publishers, Chapter 7 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 6
4. Calculate the exposure time required to expose a halftone negative.	Provide students with a worksheet with halftone exposure time problems, to be completed before the practical assignments.	Steps to HalfTone Exposure 1. Find copy highlight and shadow densities 2. Compute copy range 3. Compute excess density 4. Determine main, flash/bump exposures Printing Technology, Breton Publishers, Chapter 7 Graphic Reproduction, Bennett Publishing, Chapter 11 Photo-Offset Fundamentals, McKnight, Chapter 9

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. Expose a halftone negative.	Prepare a halftone negative of a B & W continuous tone photograph (self portrait), pointing out that halftone negatives are made by exposing continuous tone copy on film through a halftone screen.	Printing Technology, Breton Publishers, Chapter 7 Photo-Offset Fundamentals, McKnight, Chapter 9 Graphic Reproduction, Bennett Publishing, Chapter 11 Introduction to Photo-Offset Lithography, Bennett Publishing, Chapter 9
6. Process a halftone negative.		
7. Identify the dot structure in a halftone negative.	Have students draw a sketch of 5%, 50% and 95% dot patterns.	Dot Structures 1. 5% dot - shadow 2. 50% dot - midtone 3. 95% dot - highlight
8. Adjust the exposure times to reposition a dot.	Have students complete a worksheet on adjusting exposure times to achieve dot repositioning.	Graphic Reproduction, Bennett Publishing, Chapter 11 Printing Technology, Breton Publishers, Chapter 7, Section 3
9. Evaluate a halftone negative to determine the source of any problems and their solutions.	Have students prepare a critique of their completed halftone negative by referring to a checklist containing a set of criteria and values.	Printing Technology, Breton Publishers, Chapter 7, Section 3

LITHOGRAPHY (GR201-05)

Major Objective: To gain an insight into the process of preparing photographic plates, creating special effects, and printing multicolor plates.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. PHOTOGRAPHIC PLATES The student should be able to: 1. Strip a flat.	Have students strip a flat of a simple line negative.	Flat An assembly of photographic negatives or positives in position on a goldenrod support. Presensitized lithographic plates are exposed through the flat. Stripping The process of positioning and attaching the image-bearing film to the film support material. Graphic Reproduction, Bennett Publishing, Chapter 13 Introduction to Photo-Offset Lithography, Bennett Publishing, Chapter 10 Printing Technology, Breton Publishers, Chapter 10 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 6 Graphic Communications, McKnight, Unit 32

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Strip a combined flat.	Have students prepare flats containing line and halftone negatives which have been windowed/ butted.	Combined Flats Those flats containing both line and halftone negatives. Graphic Arts Fundamentals, Goodheart-Willcox, Unit 6 Printing Technology, Breton Publishers, Chapter 10
3. Strip flats for special effects.	Have students prepare flats to achieve the following special effects: 1. surprint 2. step and repeat 3. dropout 4. reverse 5. tints	Special Effects 1. Surprint-complimentary flats 2. Step and Repeat 3. Dropouts 4. Reverses 5. Tints Graphic Reproduction, Bennett Publishing, Chapter 13 Graphic Communications, McKnight, Unit 32
4. Describe the characteristics of a photographic plate.	Have students prepare a list of the characteristics of various types of plates. Have students collect technical data from plate manufacturers in preparation for their reports.	Plate Characteristics 1. Material 2. Style of ends 3. Coatings 4. Additive-Subtractive Photo-Offset Lithography, Goodheart-Willcox, Unit 8 Graphic Reproduction, Bennett Publishing, Chapter 14

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
		Printing Technology, Breton Publishing, Chapter 11
5. Expose a photographic plate.	Have students expose and process photographic plates using the special effects flats referred to above.	Photo-Offset Lithography, Goodheart-Willcox, Chapter 8 Introduction to Photo-Offset Lithography, Bennett Publishing, Chapter II
6. Process a photographic plate.		Introduction to Photo-Offset Lithography, Bennett Publishing, Chapter II Photo-Offset Fundamentals, McKnight, Chapter 13
7. Evaluate a plate to identify any problems and their solutions.	Have students critique their processed plate.	Printing Technology, Breton Publishers, Chapter 13, Section 2 Photo-Offset Fundamentals, McKnight, Chapter 19
B. TINTING The student should be able to:		
1. Describe the characteristics of a tinting screen.	Have students prepare a poster illustrating the various characteristics of tinting a screen.	Tinting Screen Characteristics 1. Percent Tint 2. Number of lines

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Explain the function of a tinting screen.		Function of Tint Screens To highlight image areas or to subdue image areas. Photo-Offset Fundamentals, McKnight, Chapter 10 Graphic Reproduction, Bennett Publishing, Chapter 9 Graphic Communications, McKnight, Unit 32
3. Prepare a photographic plate using a tinting screen.	Have students expose and process a photographic plate using a flat which incorporates a tinting screen.	Graphic Reproduction, Bennet Publishing, Chapter 9 Photo-Offset Fundamentals, McKnight, Chapter 10 Graphic Communications, McKnight, Unit 32
C. MULTICOLOR PRINTS The student should be able to:		
1. Prepare flats which represent the color separations.		Photo-Offset Fundamentals, McKnight, Chapters 10 & 12

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Explain the registration process for multicolor flats.		Photo-Offset Fundamentals, McKnight, Chapter 12
3. Expose and process plates for a multicolor print.	Have students prepare a set of plates which can be used to print the primary colors in a rainbow or color-wheel format.	
D. STEP AND REPEAT The student should be able to:		
1. Explain the "step and repeat" process.	Stress the importance of aligning the reistration marks cut in the masking sheet with those traced on the plate, and of blocking out the exposure light on the uncovered portion of the plate.	Step and Repeat The multiple exposure of one negative. Photo-Offset Fundamentals, McKnight, Chapter 12
2. Expose and process a "step and repeat" plate.	Have students prepare identification cards, business cards or tickets to illustrate their knowledge of the step and repeat process.	Photo-Offset Fundamentals, McKnight, Chapter 12 Graphic Communications, McKnight, Unit 32 Printing Technology, Breton Publishers, Chapter 10

CONTINUOUS TONE PHOTOGRAPHY (GR201-06)

Major Objectives: To gain an insight into advanced techniques of continuous tone photography.
To gain an understanding of color slide preparation.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. ADVANCED TECHNIQUES The student should be able to:		
1. Explain the effect of filters on an exposure.	Have students prepare a filter factor chart presenting the effects a filter will have on an exposure.	Filters Optical devices fitted to cameras to change or control light as it enters the camera. Types of Filters 1. Contrast Filters 2. Haze Reduction Filters 3. Skylight Filters 4. Conversion Filters 5. Color Compensating Filters 6. Polarizing Filters 7. Neutral Density Filters Exploring Photography, Goodheart-Willcox, Chapter II
2. Demonstrate the principles of photgraphic composition.	Gather and present professional and amature photographs, each representing good and poor examples of photographic composition principles.	Photographic Composition Principles 1. Simplicity 2. Balance 3. Rule of Thirds 4. Framing 5. Mergers 6. Lines

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. Relate the speed of a film to a particular lighting/motion condition.	Have students describe the speed of film required to meet different lighting/motion situations.	Exploring Photography, Goodheart-Willcox, Chapter 5 Photo One: Basic Photo Text, Prentice Hall
4. Explain the effect of aperture on depth of field.	Have students construct a chart illustrating the effect of aperture on depth of field.	
5. Produce a photographic print using at least three print manipulation techniques.	Have students demonstrate the use of different manipulation techniques in preparing prints.	Manipulation Techniques 1. Dodging 2. Burning-In 3. Vignetting 4. Diffusion 5. Perspective Distortion 6. Solarization 7. Combination Printing 8. Sandwich Printing 9. Texture Screening 10. Toning 11. Paper Negative Printing
6. Evaluate a photographic print to identify any problems and their solutions.	Have students submit a critique of their finished prints.	Exploring Photography, Goodheart-Willcox, Chapter 10

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
7. Explain the effect of shutter speeds on motion.	Have students set the f-stop and shutter speed on a camera.	
8. Describe the use of two types of exposure metering devices.	Emphasize that the two controlling factors for achieving a correct exposure are the f-stop and the shutter speed.	Metering Devices 1. Reflected light meter 2. Incident light meter
9. Demonstrate the use of metering devices.		
10. Define the focal length of a lens.		Focal Length The distance between the lens and the point where the photographic subject (located at infinity) is in sharp focus on the film.
11. Describe the characteristics of lenses of differing focal length.	Have students chart the characteristics of lenses of differing focal lengths.	
12. Prepare photographic prints using lenses of differing focal lengths.	Have all the students prepare photographic prints of the same object, but using lenses of differing focal lengths.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. COLOR SLIDES The student should be able to:		
1. Produce a positive image on film.	Have each student prepare a slide of a piece of equipment in the graphics lab or a slide in a series supporting some school project.	
2. List the steps to be followed in color slide processing.		Color Slide Processing Steps 1. First Developer 2. Wash 3. Wash 4. Reversal Bath 5. Color Developer 6. Conditioner 7. Bleach 8. Fixer 9. Wash 10. Stabilizer 11. Dryer
3. Demonstrate the multi-step developing process for color slides.	Have students compare processing instructions for developing colour slides with the Kodak E3 and the E4 kits.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Mount a processed slide.	Emphasize the importance of handling slide frames and slide mounts with care.	
5. Evaluate a slide to identify any problems and the solution to them.	Have students prepare a critique of their finished slides.	

RELIEF PRINTING (GR201-07)

Major Objective: To gain an insight into specialized forms of relief printing.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. FOIL STAMPING The student should be able to:		
1. Provide a history of the origin of foil stamping.	Provide students with references to enable them to prepare a short essay on the history of foil stamping.	Graphic Arts Fundamentals, Goodheart-Willcox, Units 11 & 12
2. Describe the uses of foil stamping.	Have students prepare a list of the various uses of foil stamping. If possible have them find actual examples of the uses of foil stamping.	Graphic Arts Fundamentals, Goodheart-Willcox, Units 11 & 12
3. List the equipment and supplies required to produce a foil stamp.	Have students label diagrams illustrating the foil stamping equipment.	Foil Stamping Equipment 1. Brass Type 2. Hand Pallet 3. Heater 4. Stamping Foil
4. Explain the process of producing a foil stamp.	Have students prepare a report on the procedure involved in producing a foil stamp. If possible, have them produce a foil stamp.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 13
5. Differentiate between the hand and machine stamping processes.	Have students produce a chart illustrating the differences between the machine and hand stamping procedures.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 13

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. FLEXOGRAPHY The student should be able to:		
1. Identify the uses of flexographic printing.	Provide students with examples of material printed by the flexographic process.	Flexography A form of relief printing using a flexible medium. Uses of Flexography 1. Rubber Stamping 2. Form Printing 3. Printing Inexpensive Books 4. Display Printing
2. List the types of printing mediums.	Have students prepare a chart illustrating the different types of printing mediums and their advantages and disadvantages.	Printing Mediums 1. Rubber 2. Plastic (Photo Polymer Resin) 3. Fibre
3. Explain the process of producing a flexographic plate.	Arrange a field trip on which students can observe the flexographic printing process.	Graphic Reproduction, Bennett Publishing, Chapter 19
4. Describe the process used to print a flexographic plate.	Have students prepare a report of their field trip outlining the flexographic printing process.	Graphic Reproduction, Bennett Publishing, Chapter 19

BINDING AND PACKAGING (GR201-08)

Major Objective: To gain an understanding of the binding and packaging process used in the graphics industry.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. COIL BINDING The student should be able to:		
1. Explain the use of the coil binding system.	Have students find and list examples of materials which are coil bound.	Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12
2. Describe the operation of the punch and comb machine.	Ask students to outline the operation of the equipment and the steps used in the coil binding process.	Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Publications, Goodheart-Willcox, Unit 12
3. List the steps to be followed in the assembly of a coil bound book.		Steps in Coil Binding 1. Assemble stock 2. Punch stock 3. Insert coil into comb assembly 4. Assemble pages on comb

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. PUNCHING		
The student should be able to:		
1. Explain the use of punched stock.	Have students collect examples of materials which have been punched.	Basic Use Loose-leaf binding
2. Describe the operation of the punching machine.	Have students present a report on the operation of punching equipment.	Graphic Reproduction, Bennett Publishing, Chapter 23
C. PAPER DRILLING		
The student should be able to:		
1. Explain the need for drilled stock.	Have students collect and list examples of drilled stock and its applications.	Basic Use Loose-leaf binding
2. Describe the operation of the drilling machine.	Have students prepare a report on the operation of a drilling machine.	Graphic Reproduction, Bennett Publishing, Chapter 23

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
D. CORNERING The student should be able to:		
1. Explain the purpose of cornering.	Have students list/collect examples of cornered stock.	Cornering The rounding of corners on stock by a die-cutting operation. Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11 Graphic Reproduction, Bennett Publishing, Chapter 23
2. Describe the operation of the cornering machine.	Have students prepare a report on the operation of a cornering machine.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11 Graphic Reproduction, Bennett Publishing, Chapter 23
E. FOLDING The student should be able to:		
1. Identify the grain of a piece of stock.	Distribute and describe paper samples of varying grains. Have students attempt folds with and across paper grain.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Describe the two types of folds.	Have students make parallel and right angle folds.	Parallel Folds Made by folding paper two or more times so that all the folds run parallel to each other. Right Angle Folds Made by folding at least one fold at a right angle to the others.
3. Explain the hand folding process.		Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12 Photo-Offset Lithography, Goodheart-Willcox, Unit 10
4. List two types of machine folders.	Have students prepare a labelled chart illustrating a knife folder and a buckle folder and describing their operation.	Buckle Folder A folding machine that buckles paper at a predetermined point when striking the fold plate stop. A pair of rollers rotate towards each other and grasp and crease the paper at the buckle. Knife Folder A folding machine that uses a thin blade to punch paper between a pair of rollers making the fold.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. Describe the operation of a machine folder.		Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12
F. STITCHING The student should be able to:		
1. Explain the need for the stitching process.	Have students list/collect examples of stitched materials.	Stitching A method of binding stock together.
2. Describe the saddle stitching operation.	Organize a field trip to a bindery where students can observe the saddle and side stitching procedure. Have students prepare a chart showing the steps in each of these processes.	Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12 Photo-Offset Lithography, McKnight, Chapter 10
3. Describe the side stitching operation.		Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12 Photo-Offset Lithography, McKnight, Chapter 10

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
G. COLLATING The student should be able to:		
1. Explain the need for the collating process.		Collating The process of gathering sheets to ensure they are in the proper sequence before they are bound.
2. Differentiate between hand and machine collating.	Have students submit a report on the operation of a machine collator.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 23 Photo-Offset Lithography, Goodheart-Willcox, Chapter 10
3. Briefly describe the operation of a machine collator.		Graphic Arts Fundamentals, Goodheart-Willcox, Unit 23 Photo-Offset Lithography, Goodheart-Willcox, Chapter 10

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
H. PERFORATING The student should be able to:		
1. State the need for having perforated stock.	Have the students list/collect examples of perforated stock.	Perforating Cutting rows of slots or dots across a sheet to facilitate folding or tearing. Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11 Photo-Offset Lithography, Goodheart-Willcox, Chapter 10
2. Explain the use of the perforating rule.		Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11 Photo-Offset Lithography, Goodheart-Willcox, Chapter 10
3. Describe the perforating operation.	Have students perforate numbered tickets.	Photo-Offset Lithography, Goodheart-Willcox, Chapter 10 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
I. SCORING The student should be able to:		
1. Explain why stock is scored.	Have students list/collect examples of scored stock.	Scoring The process of putting a crease in paper to make folding easier.
2. Describe the use of scoring rule.		Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12
3. Outline the operation of a scoring machine.	Have students prepare a report on the operation of a scoring machine.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12
J. SLITTING The student should be able to:		
1. Differentiate between slitting and trimming.	Have students list/collect and identify those materials which have been slit and those which have been trimmed.	Slitting The cutting open of creased folds in stock. Trimming The removal of unwanted portions of stock.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
K. SIGNATURE BINDING The student should be able to:		
1. Explain the use of the signature binding system.	Have students list examples of materials which are signature bound.	Signature Binding A method of binding used when a large number of sheets of paper are to be bound together.
2. Describe the signature binding operation.	Have students prepare a report outlining the steps in the signature binding process. Have students prepare a casebound book containing examples of work produced in the course.	Steps in Signature Binding 1. Printing 2. Folding 3. Gathering 4. Sewing 5. Smashing and Trimming 6. Gluing 7. Rounding 8. Lining 9. Covering 10. Stamping 11. Casing-In 12. Pressing and Drying Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12 Graphic Reproduction, Bennett Publishing, Chapter 23

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graphics 301

GRAPHICS 301

Module Title	Core-C Option-O	Page
01 Orientation and Safety	C	129 - 132
02 Image Generation	C	133 - 135
Minimum of <u>three</u> of the following: (Core)		
03 Screen Printing	O	136 - 141
04 Continuous Tone Photography	O	142 - 147
05 Process Photography	O	148 - 152
06 Lithography	O	153 - 155
07 Binding and Packaging	O	156 - 165

ORIENTATION AND SAFETY (GR301-01)

Major Objectives: To explore the significance of graphic arts in meeting the students' personal needs as well as the needs of the larger community.
To develop an attitude in the students allowing them to work effectively and safely with the materials and equipment used in graphic arts.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. PROGRAM REVIEW The student should be able to:		
1. Define graphic arts.	Have students prepare their own definitions of graphic arts. Compare their definitions with more widely accepted definitions.	Graphic Arts Printing and allied crafts, including papermaking, binding and photography.
2. Explain the purposes of studying graphics.	Illustrate to students the impact that graphics have on their daily lives. Use various examples such as: 1. Newspapers 2. Textbooks, magazines 3. Television graphics 4. Advertising signs 5. Billboards 6. Packaging	
3. List the events leading to the development of the graphics process.	Have students prepare a timeline and short essay representing the development of the graphics processes.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 1

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OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Identify the four processes central to the graphics industry.	Have students prepare definitions of each of the four processes. Discuss and show examples of each process.	Processes Central to Graphics Industry 1. Letterpress 2. Gravure 3. Screen Printing 4. Lithography Graphic Reproduction, Bennett Publishing, Unit 1
5. Describe the various methods used to copy graphic images.	Show examples of material copied by various methods.	Copying Processes 1. Continuous Tone 2. Microfilm/Microfiche 3. Blueprints 4. Electrostatic Copies Graphic Reproduction, Bennett Publishing, Unit 1
6. Explain the communication model.	Define source, message, medium and receiver, explaining how these components constitute a communication model. Emphasize that without feedback, the communication is incomplete and that dialogue is necessary.	Communication Model Source → Message → Medium → Receiver Feedback Printing Technology, Breton Publishers, Chapter 1

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. SAFETY The student should be able to:		
1. Explain the need for safe practices in the lab.	Discuss the reason for using practices which are considered safe.	Photo-Offset Lithography, Goodheart-Willcox, Unit 1 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 3
2. Differentiate between those behaviours which are considered safe and those which are not.	Have students prepare a poster illustrating (listing) practices which are considered to be safe.	
3. Outline the need for safe clothing in the lab.	Illustrate how various types of clothing can interfere with safe practices. Point out the hazards associated with loose clothing, long hair and long sleeves, jewellery. Invite students to participate in setting a dress code.	
4. Understand the need for and importance of protective devices.	Have students identify and explain the purpose of various protective devices.	Protective Devices 1. Safety glasses/goggles 2. Face shields 3. Gloves 4. Respirators 5. Hair bands 6. Machine guards 7. Aprons

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. Demonstrate the correct use of the safety aids found in the lab.	Insist that students use protective devices when needed.	
6. Demonstrate a knowledge of the organization of the lab.	Emphasize the importance of orderliness and safety in the Industrial Arts lab. Identify and discuss the purpose of separating work and storage areas.	
7. Identify and accept responsibility for housekeeping practices.	Point out that good housekeeping practices aid in preventing accidents. Have students develop housekeeping habits by assuming the responsibility for daily clean-up.	
8. Locate the safety aids in the lab.	Review procedures related to first aid, fire and accidents. Use posters to emphasize procedures.	

IMAGE GENERATION (GR301-02)

Major Objective: To gain an understanding of and develop skills in using advanced methods of image generation.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. COLOR PROOFING The student should be able to:		
1. Recognize the necessity of a color proofing system using color separated negatives.	Have students collect examples of material which they think was not colour proofed and have them justify their choice of examples.	
2. Describe the use of a color proofing system.	Have students collect technical data on a colour proofing system and prepare a report on the process.	Printing Technology, Breton Publishers, Chapter 10
3. Expose a set of color proofs from a set of color separated negatives.	Prepare a color proof by using standard color separated negatives.	
4. Process a set of color proofs.	Have students assemble the color proofs to represent the finished press copy.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. COMPUTER GENERATED GRAPHICS The student should be able to: 1. Explain the advantages of a computerized system of image generation.	Demonstrate a computer text editor. Have students prepare a report outlining the advantages of a computerized system of image generation over more traditional means of image generation.	Computerized Image Generation Advantages 1. Speedy error correction 2. Easy visualization of finished copy format 3. Storage of copy for future editing 4. Automatic features such as tabbing, centering, hyphenation, and justification. Printing Technology, Breton Publishers, Chapter 4 Graphic Reproduction, Bennett Publishing, Chapter 6 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 6 Photo-Offset Lithography, Goodheart-Willcox, Unit 4 Introduction to Photo-Offset Lithography, Bennett Publishing, Chapter 7

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Prepare a report detailing the uses of a computerized image generation system.		
3. Outline the operation of a computerized image generation system.		Introduction to Photo-Offset Lithography, Bennett Publishing, Chapter 7 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 6 Graphic Reproduction, Bennett Publishing, Chapter 6 Printing Technology, Breton Publishers, Chapter 4
4. Identify a local graphics company using a computerized image generation system and provide a description of how the system is being used by that company.		

SCREEN PRINTING (GR301-03)

Major Objective: To gain an insight into the use of screen printing as a promotional tool and into the methods used to screen print on a non-flat surface.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. PROMOTIONAL PRINTING The student should be able to:		
1. List six products which are promotional in nature and prepared by using the screen printing process.	Have students find examples of prints which can be classified as promotional.	Promotional Products 1. Decals 2. Coasters 3. Hats 4. T-Shirts (multicolored) 5. Mirror tiles 6. "Puff" prints
2. Produce a set of positives suitable for screen printing a promotional product.	Review process camera, film handling and processing procedures.	
3. List the criteria for selecting a stencil material for a particular job requirement.	Supervise a discussion on the selection of stencil materials, having students list the selection criteria.	Criteria 1. Type of ink to be used 2. Degree of resolution required 3. Number of copies to be run 4. Available equipment 5. Type of mesh being used 6. Dimensional stability

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Choose an appropriate printing ink based on the choice of substrate.	Have students list the criteria used in the selection of a printing ink.	Ink Selection Criteria 1. Screen mesh count 2. Function of finished copy - indoor or outdoor use 3. Surface of application - plastic, glass, metal, etc. 4. Gloss or flat finish 5. Drying method - absorption, air dry, heat set
5. Explain the drying procedure for a chosen ink.	Have students produce a chart outlining the five drying processes for screen printing inks.	Drying Processes 1. Oxidation 2. Absorption 3. Evaporation 4. Heat Set 5. U-V Curing Printing Technology, Breton Publishers, Chapter 20 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 17
6. Produce a personally selected promotional screen print.		

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
7. Demonstrate the proper method of clean-up for the processes used in the actual production of the print.		
8. Analyze a completed print to identify any problems, their causes and their solutions.	Have students judge their finished prints by a set of predetermined criteria.	
B. NON-FLAT PRINTING The student should be able to:		
1. Identify some printing surfaces which may not be printed in the usual manner.		Non-Flat Surfaces 1. Cylinders 2. Cones 3. Spheres 57 How To Do It Charts, Sign of the Times Publishing

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Prepare a design suitable for printing on a non-flat surface.	Emphasize that design may require some alteration based on the shape of the surface to which it is being applied, i.e.,cone. Have students prepare a design suitable for reproduction on a given shape.	
3. Set up the machinery used for printing on a non-flat surface.		Printing Technology, Breton Publishers, Chapter 15 Graphic Reproduction, Bennett Publishing, Chapter 24 Graphic Communications, McKnight, Chapter 7
4. Operate the machinery used for printing on non-flat surfaces in a fashion considered to be safe and correct.	Point out that the screen for printing on cylindrical objects always remains horizontal. The squeegee remains fixed and the screen frame slides from side to side.	
5. Produce a print on a non-flat surface.	Print a monogram on a polystyrene cup.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
6. Demonstrate the proper method of cleaning the equipment required to produce a print on a non-flat surface.	Illustrate the correct use of solvents. Point out that the screen can be stored with the stencil left on it if the job will be rerun at some future time.	
7. Analyze a finished print to identify any problems, their causes and their solutions.	Have students prepare a critique of their finished work based upon predetermined objective criteria.	
C. HALFTONE PRINTING The student should be able to:		
1. Identify materials which must be reproduced by using halftone techniques.		
2. Select stencil and screen material suitable for reproducing halftone prints.		

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. Create a photographic halftone positive for exposing a stencil.	Have students convert a black and white continuous tone photograph into a halftone screen print.	
4. Produce a quality halftone print using the screen printing process.		

CONTINUOUS TONE PHOTOGRAPHY (GR301-04)

Major Objective: To gain an understanding of the principles of advanced lighting techniques and of color printing.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. ADVANCED LIGHTING TECHNIQUES The student should be able to:		
1. List various types of artificial lighting sources.	Have students list different sources of light. Using equipment on hand, demonstrate the effects of various lighting sources.	Lighting Sources 1. Flash Bulbs 2. Strobe 3. Fluorescent 4. Ultraviolet 5. Infrared Exploring Photography, Goodheart-Willcox
2. Define characteristics of light quality.		Characteristics of Light 1. Intensity 2. Degree of diffusion 3. Color 4. Evenness 5. Light direction

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. State the effect of diffused light on a subject.	Have students make a series of photographs (of the same subject and under identical conditions) using various types of flash illumination. Prepare a written evaluation of the photos. Have students experiment with diffusers such as caps, covers, and screens.	Diffused Light 1. Even illumination. 2. Control subject contrast by degree of diffusion. 3. Shadow edges become distinct.
4. Explain the use of bounce lighting.	Have students prepare a print illustrating the use of diffusers, bounce lighting, tent lighting, and below eye level lighting.	Bounce 1. Provides "fill" lighting. 2. Provides for even illumination. 3. Fills in shadow side of subject to preserve shadow detail and avoid excessive contrast.
5. Illustrate the use of tent lighting.	Explain the use of reflector flats and the use of backdrops.	Tent Lighting 1. Used to illuminate a bright subject. 2. Preserves fine detail of shiny objects.
6. Use below eye level lighting effectively.	Have students explore the effects of all angles on the subject.	Below Eye Level Lighting Used to provide a supernatural effect.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. COLOR PRINTING The student should be able to:		
1. Explain the make-up of color negative film.	Have students collect technical data from suppliers of colour negative film and prepare a report on the make-up of the film.	Composure of Color Film 1. Supercoat 2. Emulsion (3 different layers) 3. Acetate base 4. Antihalation layer 5. Anticurl layer Exploring Photography, Goodheart-Willcox, Chapter 12
2. Describe the process of image formation on a color negative.	Point out that colour films have three separate light-sensitive emulsion layers and that each layer is sensitive to one of the three primary colours. A discussion on additive/subtractive color theory may be included at this point.	Exploring Photography, Goodheart-Willcox, Chapter 12
3. Adjust light temperatures using a filtering system.		
4. Process a color print.		

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. Evaluate a color print to determine if it contains correct color balance.	Have students compare their colour prints to a set of predetermined criteria.	
6. Differentiate between three color printing processes.	Have students prepare a report outlining the differences between colour printing processes.	Three Color Printing Processes 1. C-41 (color film) 2. E-6 (color reversal film) 3. R-2 (prints from negatives) 4. Ciba Chrome (prints from slides)
C. PORTRAITURE The student should be able to:		
1. Create a hair highlight on a subject using the appropriate lighting technique.	Have students prepare portraits of each other.	
2. Determine when to use back lighting as a means of emphasis.	Have students list situations when the use of back lighting is appropriate.	Back Lighting Used to shift visual emphasis to the foreground object.

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OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. Simulate natural lighting using top and side lighting techniques.	Have students experiement with key light and fill light to create different ratios.	
4. Select the correct lens for shooting a portrait.	Discuss the effects of various lenses on perspective and distortion.	
5. Describe the various cameras that are suitable for portraiture photography.	Relate suitability of negative size and composition to the desired effects of a portrait.	Portraiture Photography Cameras 1. 35 mm 2. View camera 3. Twin lens reflex
6. Properly position a subject for a portrait.	Discuss the need to look at the features of your subject, ie: shape of head, texture of skin, facial expression, etc., and take them into consideration when lighting. Have students experiment by changing the angle of light, the height of light, and the qualities of light as well as by using more than one light source.	
7. Use a backdrop to create a desired effect.	Have class prepare a simple backdrop.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
8. Discuss the effect of various films and papers on the finished portrait.	Have students prepare a chart outlining the effects of various films and papers on portraits.	Film & Paper Factors 1. Grain 2. Speed 3. Degree of contrast 4. Resin-coated paper 5. Fibre based paper 6. Paper surface -gloss, textured, matt 7. Paper color
9. Prepare a portrait.	Have students prepare portraits of each other. well as by using more than one light source.	

PROCESS PHOTOGRAPHY (GR301-05)

Major Objective: To gain insight into how process photography may be used to create special effects.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. DUOTONES The student should be able to:		
1. Explain the use of duotones.	Have students list/collect examples of duotones. Point out that duotones bridge the gap between halftone and full colour reproduction.	Duotone A reproduction of two halftones from a single black and white continuous tone original.
2. Use the correct terminology associated with duotones.	Have students identify a light and dark printer negative.	Light Printer A halftone negative used to carry highlight and upper middle tone detail. Dark Printer A halftone negative used to carry the lower middle tone and shadow detail.
3. State the criteria used to select an original image suitable for duotoning.	Have students identify the suitability of various black and white photographs for duotoning. Have students prepare a checklist of image criteria to be considered.	Image Criteria 1. Black and white photograph 2. Normal contrast 3. Long tonal range 4. No large monotone areas 5. Significant image detail extending from highlight areas to the shadow areas

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. Discuss the moiré problem and its solution.	Have students prepare a print which contains a moiré pattern and a print which is not moiréd.	Moiré Pattern An undesirable image produced when two different or randomly positioned screen patterns are overprinted. How to Avoid Moiré Patterns 1. Use preangled screens 2. Change the angle of the screen by 30° 3. Rotate the angle of the copy
5. Prepare light and dark printers.		Printing Technology, Breton Publishers, Chapter 8 Photo-Offset Fundamentals, McKnight, Chapter 9
6. Proof the light and dark printers.		
7. Print a duotone.		
8. Examine a duotone print to identify any problems, their causes and their solutions.	Have students prepare a critique of their completed duotones.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. POSTERIZATION The student should be able to:		
1. State the reason for using posterization.	Have students list/collect examples of posterized prints.	Posterization A simple method to create attention-getting visual effects or change a specific photograph to a generalized image.
2. Discuss the problems associated with posterization.	Using the examples collected, have students identify problems associated with posterization.	Posterization Problems 1. Results may be unrecognizable 2. Proper exposure may be difficult to calculate for line conversions.
3. Prepare the negatives for a three-tone posterization.	Have students calculate exposure using the following data: 1. Basic Exposure (BE) -- the same exposure used for normal line copy. 2. Highlight printer -- ½ BE 3. Midtone printer -- 1½- 2 BE 4. Shadow printer -- 4 - 5 BE	Printing Technology, Breton Publishers, Chapter 8
4. Print an example of a posterization.	Have student prepare a posterization print.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
5. Examine the finished copy to identify any problems, their causes and their solutions.	Have the students prepare a critique of their finished posterization.	
C. SPREADS AND CHOKES The student should be able to:		
1. Define the terms spread and choke.	Provide notes and examples.	Spreading A method of enlarging line copy to produce a heavier or bolder image. Choking A method of reducing line copy to make a lighter or smaller image.
2. State the uses of spreads and chokes either in a combined or individual format.	Have student list/collect examples of spreads and chokes.	Uses of Spreads and Chokes 1. Individually, spreads and chokes are used with type to increase or decrease the width of letters 2. Combined spreads and chokes are used to outline letters 3. A spread is used for line work when it is to be imposed over a background

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
3. Prepare an outline using a spread and choke.	Have students prepare and print a spread and choke.	Graphic Reproduction, Bennett Publishing, Chapter 12
4. Print an outline produced by a spread or choke negative.	Point out that spreads are made from film negatives while chokes are made from film positives.	
5. Analyze a piece of finished copy to identify any problems, their causes and their solutions.	Have students prepare a critique of their completed work.	

LITHOGRAPHY (GR301-06)

Major Objective: To explore the lithographic color process.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. PROCESS PHOTOGRAPHY The student should be able to:		
1. Identify the primary additive colors.	Have students prepare a color wheel.	Primary Additives Colors 1. Red 2. Blue 3. Green
2. List the primary subtractive colors.		Primary Subtractive Colors 1. Cyan 2. Magenta 3. Yellow
3. Explain the process of color separation using filters.	Have students prepare a chart outlining the color separation process.	Printing Technology, Breton Publishers, Chapter 9 Graphic Reproduction, Bennett Publishing, Chapter 18 Photo-Offset Lithography, Goodheart-Willcox, Chapter 6 Photo-Offset Fundamentals, McKnight, Chapter 10

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
4. State what step is taken to avoid the production of a moiré pattern during the half-toning process.		Angling of Screens 1. Yellow printer 90° 2. Magenta printer 75° 3. Cyan printer 105° 4. Black printer 45°
5. Differentiate between processes used to produce color separations.		Color Separation Processes 1. Direct screen separations 2. Indirect screen separations 3. Electronic color scanning Photo-Offset Fundamentals, McKnight, Chapter 10
6. Discuss the advantages and disadvantages of each process.	Have students prepare a report outlining color separation processes. The chart should include the advantages and disadvantages of each process.	Direct Separations Advantages: 1. Cost effective 2. Time efficient Disadvantages: 1. Low quality dot structure 2. Inability to color correct Indirect Separations Advantages: 1. Color correctable 2. Proofable 3. Good quality dot structure

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
		Disadvantages: 1. Slow to make 2. Expensive
B. APPLICATIONS The student should be able to:		
1. Print a four color reproduction.	Have students produce a four colour print from colour separated negatives.	
2. Analyze a four color reproduction to identify any problems, their causes and their solutions.	Have students prepare a critique of their finished work.	

BINDING AND PACKAGING (GR301-07)

Major Objective: To gain an understanding of the binding and packaging process used in the graphics industry.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
A. COIL BINDING The student should be able to:		
1. Explain the use of the coil binding system.	Have students find and list examples of coil bound materials.	Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12
2. Describe the operation of the punch and comb machine.	Have students prepare an outline of the operation of the equipment and the steps used in the coil binding process.	Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Publications, Goodheart-Willcox, Unit 12
3. List the steps in the assembly of a coil bound book.		Steps in Coil Binding 1. Assemble stock 2. Punch stock 3. Insert coil into comb assembly 4. Assemble pages onto comb

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
B. PUNCHING The student should be able to:		
1. Explain the use of punched stock.	Have students collect examples of materials which have been punched.	Basic Use Loose leaf binding
2. Describe the operation of the punching machine.	Have students prepare a report on the use of punching equipment.	Graphic Reproduction, Bennett Publishing, Chapter 23
C. PAPER DRILLING The student should be able to:		
1. Explain the need for drilled stock.	Have studentscollect and list examples of drilled stock and its applications.	Basic Use Loose leaf binding
2. Describe the operation of the drilling machine.	Have students prepare a report on the operation of a drilling machine.	Graphic Reproduction, Bennett Publishing, Chapter 23

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
D. CORNERING The student should be able to:		
1. Explain purpose of cornering.	Have students list/collect examples of cornered stock.	Cornering The rounding of corners on stock using a die-cutting operation. Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11 Graphic Reproduction, Bennett Publishing, Chapter 23
2. Describe the operation of the cornering machine.	Have students prepare a report on the operation of a cornering machine.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11 Graphic Reproduction, Bennett Publishing, Chapter 23
E. FOLDING The student should be able to:		
1. Identify the grain of a piece of stock.	Distribute and describe paper samples of varying grains. Have students attempt folds with and across paper grain.	

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
2. Describe two types of folds.	Have students make example parallel and right angle folds.	Parallel Folds Made by folding paper two or more times so that all the folds run parallel to each other. Right Angle Folds Made by folding at least one fold at a right angle to the others.
3. Explain the hand folding process.		Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit T2 Photo-Offset Lithography, Goodheart-Willcox, Chapter 10
4. List two types of machine folders.	Have student prepare a labelled chart illustrating a knife folder and a buckle folder and describing their operation.	Types of Folders 1. Buckle Folder 2. Knife Folder Graphic Reproduction, Bennett Publishing, Chapter 23
5. Describe the operation of a machine folder.		Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit T2

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
F. STITCHING The student should be able to:		
1. Explain the need for the stitching process.	Have students list/collect examples of stitched materials.	Stitching A method of binding stock together.
2. Describe the saddle stitching operation.		Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12 Photo-Offset Lithography, McKnight, Chapter 10
3. Describe the side stitching operation.	Arrange a field trip to a bindery where students can observe the saddle and side stitching procedure. Have students prepare a chart showing the steps in each of these processes.	Graphic Reproduction, Bennett Publishing, Chapter 23 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12 Photo-Offset Lithography, McKnight, Chapter 10

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
G. COLLATING The student should be able to:		
1. Explain the need for the collating process.		Collating The process of gathering sheets to ensure they are in the proper sequence before they are bound.
2. Differentiate between hand and machine collating.		Graphic Arts Fundamentals, Goodheart-Willcox, Unit 23 Photo-Offset Lithography, Goodheart-Willcox, Chapter 10
3. Briefly describe the operation of a machine collator.	Have students submit a report on the operation of a machine collator.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 23 Photo-Offset Lithography, Goodheart-Willcox, Chapter 10

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
H. PERFORATING The student should be able to:		
1. State the need for having perforated stock.	Have students list/collect examples of perforated stock.	Perforating Cutting rows of slots or dots across a sheet to facilitate folding or tearing. Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11 Photo-Offset Lithography, Goodheart-Willcox, Chapter 10
2. Explain the use of the perforating rule.		Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11 Photo-Offset Lithography, Goodheart-Willcox, Chapter 10
3. Describe the perforating operation.	Have students perforate numbered tickets.	Photo-Offset Lithography, Goodheart-Willcox, Chapter 10 Graphic Arts Fundamentals, Goodheart-Willcox, Unit 11

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
I. SCORING The student should be able to:		
1. Explain why stock is scored.	Have students list/collect examples of scored stock.	Scoring The process of putting a crease in paper to make folding easier.
2. Describe the use of scoring rule.		Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12
3. Outline the operation of a scoring machine.	Have students prepare a report on the operation of a scoring machine.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit 12
J. SLITTING The student should be able to:		
1. Differentiate slitting from trimming.	Have students list/collect and identify those materials which have been slit and those which have been trimmed.	Slitting The cutting open of creased folds in stock. Trimming The removal of unwanted portions of stock.

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
K. SIGNATURE BINDING The student should be able to:		
1. Explain the use of the signature binding system.	Have students list examples of materials which are signature bound.	Signature Binding A method of binding used when there are a large number of sheets of paper to be bound together.
2. Describe the signature binding operation.	Have students prepare a report outlining the steps in the signature binding process.	Steps in Signature Binding 1. Printing 2. Folding 3. Gathering 4. Sewing 5. Smashing and Trimming 6. Gluing 7. Rounding 8. Lining 9. Covering 10. Stamping 11. Casing-In 12. Pressuring and Drying

OBJECTIVES	TEACHERS' NOTES AND SUGGESTED ACTIVITIES	SUGGESTED MATERIALS
L. APPLICATION The student should be able to: 1. Prepare a casebound book containing examples of work produced in the course.	Have students assemble a course book.	Graphic Arts Fundamentals, Goodheart-Willcox, Unit T2 Graphic Reproduction, Bennett Publishing, Chapter 23

bibliography

BIBLIOGRAPHY

RECOMMENDED MATERIAL

101, 201, 301	Graphic Arts Technology. (Karsnitz) Albany, NY: Delmar Publishers, 1984. (DP)
101, 201, 301	Graphic Arts Fundamentals. (Walker) South Holland, IL: Goodheart-Willcox, 1980. (GW)
301	Exploring Photography. (Walker/Walker) South Holland, IL: Goodheart-Willcox, 1983. (GW)

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GRAPHICS 101

MODULES	GRAPHIC ARTS TECHNOLOGY	GRAPHIC ARTS FUNDAMENTALS
- Orientation & Safety		
A. Program Review		Unit 1
B. Safety		Unit 3
- Career Exploration	Chapter 1	Unit 2
A. Industrial Structure	Chapter 3,8,13,19	
B. Education	Chapter 24,28,30,33	Unit 2
- Design		
A. Design Elements	Chapter 4	Unit 13
B. Design Principles	Chapter 5	Unit 13
C. Design Steps	Chapter 12	Unit 13
- Image Generation		
A. Dry Transfer	Chapter 10	Unit 6
B. Pen & Ink	---	Unit 6
C. Strike On	Chapter 10	Unit 6
D. Commercially Prepared Copy Components	Chapter 10	Unit 6
- Layout		
A. Lettering	---	---
B. Measurement	---	Unit 5
C. Tools & Equipment	---	---
D. Paste-Up	Chapter 12	Unit 6
- Relief Printing		
A. Introduction	---	Unit 1
B. Sign Press	---	---
C. Letterpress	Chapter 23	Unit 5
D. Rubber Stamp	Chapter 23	Unit 11

MODULES	GRAPHIC ARTS TECHNOLOGY	GRAPHIC ARTS FUNDAMENTALS
- Screen Process Printing	Chapter 22, 26	Unit 8
A. Hand Cut Film Stencils	Chapter 22, 26	Unit 8
B. Photographic Film Stencils	Chapter 12	Unit 6
C. PMT Receiver Film		
- Continuous Tone Photography	Chapter 11	Unit 15
A. Composition	Chapter 11	Unit 15
B. Cameras	Chapter 11	Unit 15
C. Black & White Film Processing	Chapter 11	Unit 15
D. Enlarging		
- Lithography	Chapter 25	Unit 4,6
A. Offset Principles	Chapter 25	Unit 4,6
B. Press Types		
- Binding & Packaging	Chapter 29	Unit 12
A. Padding	Chapter 29	unit 12
B. Stapling	Chapter 29	Unit 12
C. Cornering	Chapter 32	Unit 16
D. Paper	Chapter 29	Unit 16
E. Paper Cutter		
- Process Photography	Chapter 15	Unit 6
A. Line Photography	Chapter 12	Unit 6
B. PMT Process		

GRAPHICS 201

MODULES	GRAPHIC ARTS TECHNOLOGY	GRAPHIC ARTS FUNDAMENTALS
- Student Orientation & Safety		
A. Program Review	---	Unit 1
B. Safety	---	Unit 3
- Image Generation		
A. PMT	Chapter 12	
B. Strip Printing	Chapter 10	Unit 6
C. Airbrush	---	---
- Screen Printing		
A. Photo Direct Screen Printing	---	Unit 8
B. Photo Indirect Screen Printing	Chapter 22	Unit 8
C. Direct/Indirect Screen Printing	---	Unit 8
D. Multicolor Screen Printing	---	Unit 8
E. Heat Transfer	---	Unit 9
F. Vacuum Screen Printing	---	---
- Process Photography		
A. Review of Image Generation	---	Unit 6
B. Line Negatives	Chapter 15	Unit 6
C. Halftone Negatives	Chapter 16	Unit 6
- Lithography		
A. Photographic Plates	Chapter 20	Unit 6
B. Tinting	Chapter 18	Unit 5,6
C. Multicolor Prints	Chapter 18	Unit 5,6
D. Step & Repeat	Chapter 20	---
- Continuous Tone Photography		
A. Advanced Techniques	---	---
B. Color Slides	---	---

MODULES	GRAPHIC ARTS TECHNOLOGY	GRAPHIC ARTS FUNDAMENTALS
- Relief Printing		
A. Foil Stamping	---	Unit 11,12,13
B. Flexography	Chapter 23,27	---
-Binding & Packaging		
A. Coil Binding	Chapter 29	Unit 12
B. Punching	Chapter 29	Unit 12
C. Paper Drilling	Chapter 29	---
D. Cornering	Chapter 29	Unit 11
E. Folding	Chapter 29	Unit 12
F. Stitching	Chapter 29	Unit 12
G. Collating	Chapter 29	Unit 12, 23
H. Perforating	Chapter 29	Unit 11, 12
I. Scoring	Chapter 29	Unit 12
J. Slitting	Chapter 29	Unit 12
K. Signature Binding	Chapter 29	Unit 12

GRAPHICS 301

MODULES	GRAPHIC ARTS TECHNOLOGY	GRAPHIC ARTS FUNDAMENTALS	EXPLORING PHOTOGRAPHY
- Student Orientation & Safety			
A. Program Review		Unit 1	
B. Safety		Unit 3	
- Image Generation			
A. Color Proofing	Chapter 17		
B. Computer Generated Graphics	Chapter 4	Unit 6	
- Screen Printing			
A. Promotional Printing	---	Unit 17	
B. Non-Flat Printing	---	Unit 17	
C. Halftone Printing	---	Unit 17	
- Continuous Tone Photography			
A. Advanced Lighting Techniques	---	---	Chapter 7
B. Color Printing	Chapter 17	---	Chapter 12
C. Portraiture	---	---	
- Process Photography			
A. Duotones	Chapter 18	Unit 6	
B. Posterization	Chapter 18	Unit 6	
C. Spreads and Chokes	Chapter 15	---	
- Lithography			
A. Process Photography	Chapter 17	Unit 14	
B. Applications	Chapter 17	Unit 14	

MODULES	GRAPHIC ARTS TECHNOLOGY	GRAPHIC ARTS FUNDAMENTALS	EXPLORING PHOTOGRAPHY
-Binding & Packaging			
A. Coil Binding	Chapter 29	Unit 12	
B. Punching	Chapter 29	Unit 12	
C. Paper Drilling	Chapter 29	---	
D. Cornering	Chapter 29	Unit 11	
E. Folding	Chapter 29	Unit 12	
F. Stitching	Chapter 29	Unit 12	
G. Collating	Chapter 29	Unit 12, 23	
H. Perforating	Chapter 29	Unit 11, 12	
I. Scoring	Chapter 29	Unit 12	
J. Slitting	Chapter 29	Unit 12	
K. Signature Binding	Chapter 29	Unit 12	
L. Application	---	Unit 12	

REFERENCE MATERIAL

Advertising Graphics. (Bockus, H.W.) 3rd ed. Don Mills, ON: Collier MacMillian, 1979. (CM)

Bigger and Better Enlarging in Color and Black and White. (Anderson, Rex, and Nibbelink, Don) Garden City, NY: American Photographic, 1974. (APBP)

Comprehensive Graphic Arts. (Dennis, E.A., and Jenkins, J.D.) Indianapolis, IN: Howard W. Sams, 1974. (HWS)

Colour Processing and Printing. (Brandeis, Ann) Rexdale, ON: John Wiley & Sons, 1983. (JWS)

Creative Darkroom Techniques. (Editors of Kodak) Toronto, ON: Kodak Canada, 1975. (KC)

Do-It-Yourself Graphic Design. (Laing, John) New York, NY: Facts on File, 1984. (FFP)

Focus on Designing. (Hubel, V. and Lussow, D.) Scarborough, ON: McGraw-Hill Ryerson, 1984. (MHR)

Fun and Profit With Screen Printing. (Mika, Nick, and Mika, Helma) Belleville, ON: Mika, 1970. (MPS)

Graphic Communications. (Broekhuizen, R.J.) Peoria, IL: McKnight, 1973. (MKP)

Graphic Reproduction. (Spence, W.P., and Vequist, D.G.) New York, NY: Bennett, 1980. (BPC)

Handbook of Photography. (Lovell, R.P., Zwahlen, F.C., Folts, J.A.) New York, NY: Bennett, 1984. (BPC)

How to Create Photographic Special Effects. (Horvath, Allan) Canfield, OH: Fischer, 1979. (FP)

In-Camera Special Effects. (Stensvold, Mike) Rexdale, ON: John Wiley & Sons, 1983. (JWS)

Introduction to Photo-Offset Lithography. (Hird, K.) New York, NY: Bennett, 1981. (BPC)

Intro to Graphic Arts. (Swerdlow, R.M.) Chicago, IL: American Technical Society, 1979. (ATS)

Kodak Color Darkroom Dataguide. (Editors of Kodak) 7th ed. Toronto, ON: Kodak Canada, 1980. (KC)

Kodak Guide to 35mm Photography. (Editors of Kodak) Toronto, ON: Kodak Canada, 1976. (KC)

Kodak Color Darkroom Dataguide. (Editors of Kodak) 7th Ed. Toronto, ON: Kodak Canada, 1980. (KC)

Kodak Guide to 35mm Photography. (Editors of Kodak) Toronto, ON: Kodak Canada, 1976. (KC)

Kodak Rules of Photographic Composition. (Editors of Kodak) Toronto, ON: Kodak Canada, 1979. (KC)

Layout: The Design of the Printed Page. (Hurlburt, Allen) New York, NY: Watson-Guptill, 1977. (WGP)

LIFE Library of Photography Series. (Editors of Time-Life) Alexandria, VA: Time-Life Books. (TLB)
Caring or Photography, 1983
Color, 1981
Documentary Photography, 1983
Great Photographers, 1983
Light and Film, 1981
Photography as a Tool, 1982
Photographing Children, 1983
Photojournalism, 1983
Photographing Nature, 1981
Special Problems, 1981
The Art of Photography, 1981
The Camera, 1981
The Great Themes, 1982
The Studio, 1982
Travel Photography, 1982

More Joy of Photography. (Editors of Kodak) Toronto, ON: Kodak Canada, 1981. (AWP & KC)

Photo-Offset Fundamentals. (Cogoli, J.) Peoria, IL: McKnight, 1967. (MKP)

Photo-Offset Lithography. (Prust, Z.A.) South Holland, IL: Goodheart-Willcox, 1977. (GW)

Photo One: Basic Photo Text. (Muse, Ken) Scarborough, ON: Prentice Hall, 1973. (PH)

Photo Two: Advanced Photo Text. (Muse, Ken) Scarborough, ON: Prentice Hall, 1973. (PH)

Preparing Art and Camera Copy for Printing. (Latimer, H.) Scarborough, ON: McGraw-Hill Ryerson, 1977. (MHR)

Printing Technology. (Adams, J. Michael, and Faux, David D.) New York, NY: Breton, 1982. (BP)

Production for the Graphic Designer. (Craig, James) New York, NY: Watson-Guptill, 1974. (WGP)

Programmed Photography: Lenses. (Keshishoglou, John) Garden City, NY: Amphoto - American Photographic, 1972. (AAP)

Screen Printing Techniques. (Kosloff, Albert) Cincinnati, OH: Signs of the Times, 1972. (STP)

Screen Printing. (Biegeleison, J.I.) New York, NY: Watson-Guptill, 1971. (WGP)

The Advanced Airbrush Book. (Misstear, C. and Scott-Harman, H.) New York, NY: Van Nostrand Reinhold, 1982. (VNR)

The Airbrush Book: Art, History and Technique. (Curtis, Seng-gye T. and Hunt, Christopher) New York, NY: Van Nostrand Reinhold, 1980. (VNR)

The Complete Airbrush Book. (Maurello, S. Ralph) New York, NY: Leon Amiel, 1980. (LAP)

The Here's How Book of Photography. (Editors of Kodak) Toronto, ON: Kodak Canada, 1971. (KC)

The Home Darkroom. (Fineman, Mark) Garden City, NY: American Photographic Book, 1973. (APBP)

The Photographers Handbook. (Hedgecol, John) Mississauga, ON: Random House, 1982. (RH)

Understanding Graphic Arts. (Hird, K.) Cincinnati, OH: South Western, 1982. (SW)

What The Printer Should Know About Paper. (Bureau, Wm.) Pittsburgh, PA: Graphic Arts Technical Foundation, 1983. (GATF)

57 How-To-Do-It Charts. (Hiett, H.) Cincinnati, OH: Signs of the Times, 1976. (STP)

Airbrush Techniques, set of 4 video cassettes (BPR)

Black and White Copy Preparation, 4 filmstrips with tapes (VAI)

The following materials are available from:

Instructional Media Associates Inc.
225 W. University Drive, Suite 108
Tempe, AZ 85821 USA

Camera Techniques Series, 7 filmstrips with tapes

Color Series, 5 filmstrips with tapes

Darkroom Procedures, 5 filmstrips with tapes

The following materials are available from:

Kodak Canada
Photographics Markets Information Bureau
3500 Eglinton Avenue W.
Toronto, ON M6M 1V3

0051 Advanced Black-and-White Printing (slides)

0016 Basic Picture-Taking Techniques (slides)

0050 Beginning Black-and-White Printing (slides)

0005 Better Pictures by Existing Light (slides)

0066 Careers in Photography: An Expanding World (slides)

0040	Color Printing from Color Negatives (slides)
0366	Discovering Underwater Photography (movie)
0026	Film--How It Works (slides)
ED 10-2	Halftones and Other Tones (slides, tape and script)
0039	Holland--A Garden of Pictures (slides)
0055	How Prizewinning Photos Are Made (slides)
0384	Images for Imagination (movie)
0030	Kodak Program Series 35: An Introduction (slides)
0057	Kodak Program Series 35: Creative Use of Lenses (slides)
0028	Kodak Program Series 35: Imaginative Use of Filters (slides)
ED 10-1	Line Photography (slides, tape and script)
0319	More Than Photography--A Visit to Eastman Kodak Company (movie)
0038	Photo Reports Make It Happen (slides)
1010	Photo Techniques Series (slides and movie)
0048	Photographing People (slides)
0345	Photography--How It Works (movie)
0044	Photos Help You When Disaster Strikes (slides)
0079	Processing Black-and-White Film (slides)

1000	Special Photography Series (slides and movie)
ED 10-3	The Basics of Four--Colour Reproduction (slides, tape andscript)
0008	The Beginnings of Photographic Composition (slides)
0202	The Film/Paper Story (movie)

The following materials are available from:

Manitoba Education Library
Main Floor, 1181 Portage Avenue
Winnipeg, MB R3G 0T3

Kits

K 686.2315 B38	Basic Offset Press
K 686.22 G73	Graphic Arts Reproduction
K 686.22 J63	Jobs in Printing
K 686.2314 P53	Masking and Platemaking Operations Explained
K 686.2325 N43	Producing Negatives for the Off-set Process
K 686.2315 F64	The Folding Machines Explained
K 686.2315 034	The Offset Press Water-Ink Systems and Accessories
K 686.2315 P36	The Paper-Cutter Explained

16mm Film		Grade
2702	Learning to Set Type (Type-setting)	7 - 12
1848	Let's Make A Film (Yellow Ball Workshop, Newton, MA, Moving-pictures - Production and direction)	K - 12
1334	Printing Platen Press Make Ready (Art; Platen Presses; Printing)	7 - 12
1786	Putting A job On A Platen Press (Platen presses)	7 - 12
2108	Spots and Floods Lights For Illusion (Stage lighting)	7 - 12
2366	Typesetting (Intertype; Type-setting machines)	7 - 12
1085	Why Communications Satellites (Satellites in telecommunications)	4 - 12
Video Recordings		
VR 331.702 R42	Climbing The Ladder (Job Search Series)	7 - 12
VR 331.702 R42	First Impressions (Job Search Series)	7 - 12
VR 331.702 R42	Getting Ready (Job Search Series)	7 - 12
VR 331.702 R42	The Interview (Job Search Series)	7 - 12
VR 331.702 R42	The Market (Job Search Series)	7 - 12
VR 331.702 R42	Your Calling Card (Job Search Series)	7 - 12

The following materials are available from:

National Institute for Instructional Materials
120 Driftmier Engineering Centre
Athens, GA 30602 USA

Components of the Offset Press, #HB112

Copyfitting, #HB111

Halftone Computer, #HB110

Ink Trapping Computer, #HB114

We Used To Call It Printing, 27 minutes, color (DP)

MAGAZINES, JOURNALS, PERIODICALS

DESIGN GRAPHICS WORLD
available from: Design Graphics World
6255 Barfield Road
Atlanta, GA 30328 USA

GRAPHIC ARTS MONTHLY
available from: Circulation Services Centre
P.O. Box 1034
Barrington, IL 60010 USA

INDUSTRIAL EDUCATION
available from: Cummins Publishing Company
1495 Maple Way
Troy, MI 48084 USA

PHOTOLIFE
available from: 130 Spy Court
Markham, ON L3R 9Z9

POPULAR PHOTOGRAPHY
available from: 3460 Wilshire Boulevard
Los Angeles, CA 90016 USA

SCHOOL SHOP
available from: Prakken Publications Inc.
416 Longshore Drive
P.O. Box 8623
Ann Arbor, MI 48107 USA

SCREEN PRINTING
available from: Sign of the Times Publishing
407 Gilbert Avenue
Cincinnati, OH 45202 USA

SIGNS OF THE TIMES
available from: Signs of the Times Publishing
407 Gilbert Avenue
Cincinnati, OH 45202 USA

STEP-BY-STEP GRAPHICS
available from: 6000 North Forest Park Drive
P.O. Box 1901
Peoria, IL 61656 USA

THE STUDIO MAGAZINE
available from: Roger Murray and Associates Inc.
215 Carlingview Drive, Ste. 102
Rexdale, ON M9W 5X8

THE TECHNOLOGY TEACHER
available from: International Technology
Education Association
1914 Association Drive
Reston, VA 22091 USA

(AAP) Amphoto - American Photographic
Book Publishing Company
Garden City, NY 10016 USA

(APBP) American Photographic Book
Publishing Company
Garden City, NY 10016 USA

(ATS) American Technical Society
Chicago, IL 60637 USA

(AWP) Addison-Wesley Publishers Ltd.
P.O. Box 580
26 Prince Andrew Place
Don Mills, ON M3C 2T8

(BP) Breton Publishers
Statler Office Building
20 Park Plaza
Boston, MA 02116 USA

(BPC) Bennett Publishing Company
866 Third Avenue
New York, NY 10022 USA

(BPR) Bergwall Productions
Garden City, NY 11530 USA

(CM) Collier MacMillian Canada Inc.
50 Gervais Drive
Don Mills, ON M3C 3K4

(DP) E. I. DePont DeNemours & Company, Inc.
Advertising Department, Audio Visual Section
Wilmington, DE 19898 USA

(FFP) Facts on File Publications
460 Park Avenue South
New York, NY 10016 USA

(FP) Fischer Publishing
P.O. Box 116
7851 Herbert Road
Canfield, OH 44406 USA

(GAFT) Graphic Arts Technical Foundation
4615 Forbes Avenue
Pittsburgh, PA 15213-5796 USA

(GW) Goodheart-Willcox Company
123 W. Taft Drive
South Holland, IL 60473 USA

(HWS) Howard W. Sams Company Inc.
4300 W. 62nd Street
Indianapolis, IN 46268 USA

(JWS) John Wiley & Sons Canada Ltd.
22 Worcester Road
Rexdale, ON M9W 1L1

(KC) Kodak Canada
3500 Eglinton Avenue W.
Toronto, ON M6M 1V3

(LAP) Leon Amiel Publisher, Inc.
31 West 46th Street
New York, NY 10036 USA

(MHR) McGraw-Hill Ryerson Limited
330 Progress Avenue
Scarborough, ON M1P 2Z5

(MKP) McKnight Publishing Company
809 W. Deteveiller
Peoria, IL 61615 USA

(MPS) Mika Publishing Company
P.O. Box 536
Belleville, ON K8N 5BZ

(PH) Prentice-Hall Canada Inc.
1870 Birchmount Road
Scarborough, ON M1P 2J7

(RH) Random House of Canada Limited
1265 Aerowood Drive
Missisauga, ON L4W 1B9

(STP) Signs of the Times Publishing
407 Gilbert Avenue
Cincinnati, OH 45202 USA

(SW) South Western Publishing Company
510 Madison Road
Cincinnati, OH 45227 USA

(TLB) Time-Life Books
777 Duke Street
Alexandria, VA 22314 USA

(VAI) Video Art Instruction
Port Washington, NY 11050 USA

(VNR) Van Nostrand Reinhold Company
135 West 50th Street
New York, NY 10020 USA

(WGP) Watson-Guptill Publishing, Inc.
1 Astor Plaza, 1515 Broadway
New York, NY 10036 USA